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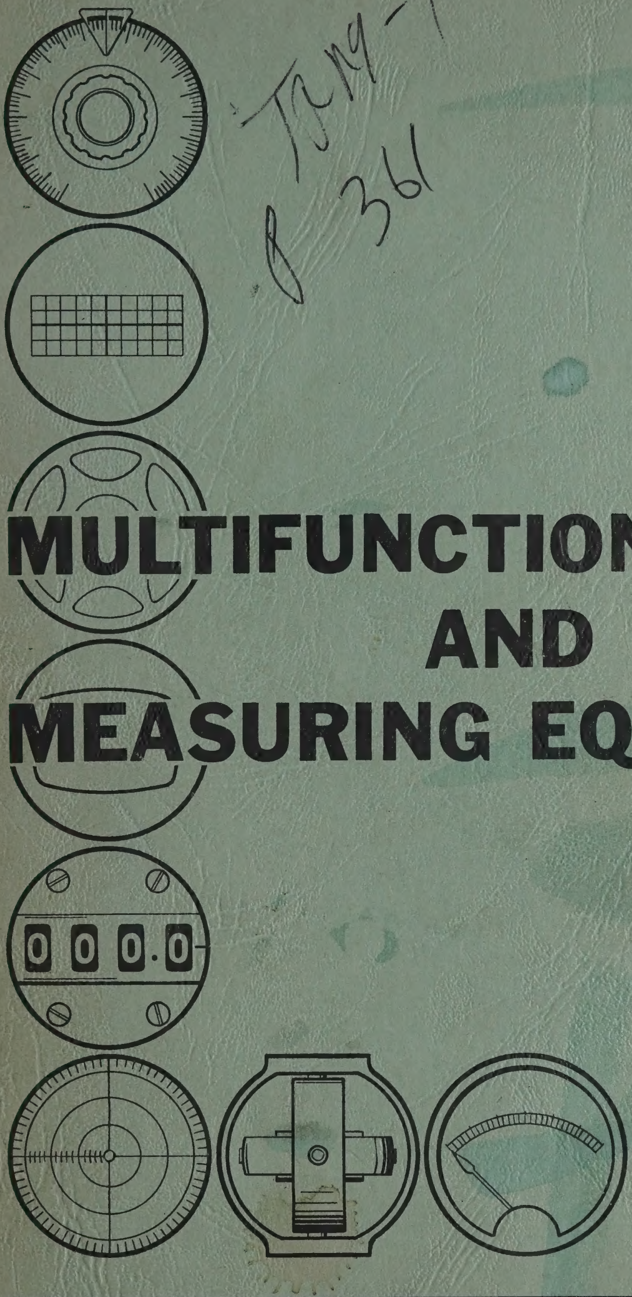

MULTIFUNCTIONAL TEST AND MEASURING EQUIPMENT

FREDERICK RESEARCH CORPORATION

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ELECTRICAL & ELECTRONIC

TEST EQUIPMENT DATA HANDBOOK

VOLUME 10A

MULTIFUNCTIONAL TEST AND MEASURING EQUIPMENT

FREDERICK RESEARCH CORPORATION
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TO THE USERS OF THIS HANDBOOK:

In recognition of the many problems associated with the selection of electrical-electronic test equipment for specific applications, Frederick Research Corporation has compiled a series of volumes which contain test equipment descriptions. The items described in the volumes are primarily those used by government agencies and contractors. At the request of the government, and in the interest of providing users with the desired information without the necessity of costly search and compilation, this firm has made this unclassified data available to government agencies and contractors for many years.

The United States Senate has twice cited the Frederick Research Corporation in the Congressional Record (1955 and 1960) for its achievements in efforts to save the government millions of dollars by avoiding duplication in government purchases and promoting the development and utilization of the best test equipment at the lowest cost consistent with quality. We believe that the material in these volumes should provide a means for users to review their test equipment requirements with a minimum expenditure of funds and technical man-hours.

FREDERICK RESEARCH CORPORATION

AIDS TO USE OF THE VOLUMES

This series of volumes has been prepared for the purpose of aiding engineers and other personnel in the selection of electrical-electronic test equipment to satisfy numerous test requirements. Thus, the format of the descriptive sheets has been specifically designed to provide the concise equipment data necessary for the selection procedure - functional description, electromechanical characteristics, reference source data, and other pertinent information. All data is as complete and current as the information available at the time the equipment description was prepared.

To save the maximum amount of time and to facilitate easy location of a particular item, the complete series has been divided into volumes based upon the accepted functional classification of equipment types. Thus, all equipments performing a specific type of test, monitoring, or measurement function are contained in one volume. For example, all equipments performing Voltage and Current Measuring functions are contained in Volume 1. Where the number of equipment descriptions in a particular class is insufficient to warrant an entire book, more than one volume (class) of equipment descriptions may be included in one book. For example, Volumes 5, 6, 7, 8 and 9 are contained in one book. The volumes are separated by green divider sheets.

Conversely, where the number of equipment descriptions is so large that a single book would be cumbersome, the volume will consist of two or more parts. For instance, Volume 10 is sufficiently large to warrant its division into parts.

Within each functional class and its subclasses, the descriptive sheets are arranged in alpha-numerical order based upon the equipment designation, e.g., ME-6B/U, ME-6D/U, ME-30/U, TS-375/U, and similarly until all descriptions in one particular class are covered.

The definitions and index of the functional classification categories and subclassifications will be found on the following pages. The alpha-numerical arrangement is provided to aid the user in his search for items in the event that only item nomenclature is known.

As an example of use of the Handbook, assume specific test requirements arise which dictate the use of a vacuum tube voltmeter (VTVM). To determine if there is an equipment having the necessary characteristics, locate the List of Handbook Volumes on Page iii in any of the Handbook volumes and note that voltage and current measuring equipments are located in Volume 1.

In Volume 1 turn to the Electronics Test Equipment Functional Classifications to find the functional class under which VTVM's appear. From the listing, it is seen that voltage measuring equipments are assigned the functional class of 1.1 and that VTVM's are most likely included in the subclass 1.1.1 Electronic Voltmeter. A check of the functional class definitions provided on Page vii will verify this.

Next, turn to the yellow divider, 1.1 Voltage Measuring Equipment, and proceed in that section to the equipment descriptions assigned the functional class 1.1.1. All VTVM descriptions will appear in alpha-numerical order within this section. Alpha-numerical listings of equipment descriptions within each subclass are provided in the Table of Contents.

Data on specific pieces of test equipment may also be quickly located. For instance, assume that one wanted to look up the characteristics of the ME-6D/U Electronic Multimeter. First, locate the correct volume as in the above example, which in this case is again Volume 1. In Volume 1 refer to the Alpha-Numerical Index, locate the item and note its functional class as being 1.1.1. Next, turn to the yellow divider 1.1 Voltage Measuring Equipment and proceed in that section to the descriptions assigned the functional class 1.1.1. The ME-6D/U is placed alpha-numerically in this class, physically located between the ME-6B/U and the ME-30/U.

A standard data format is used throughout the Handbook. Once the user has become familiar with this format, he will find it easy to locate specific data on a given instrument as well as convenient for the comparison of several instruments.

LIST OF HANDBOOK VOLUMES

Title	Volume
Voltage and Current Measuring Equipment	1
Frequency Measuring Equipment	2
Waveform Measuring and/or Analyzing Equipment	3
Signal Generating Equipment	4
Field Strength and Intensity Measuring Equipment	5
Impedance and Standing Wave Ratio Measuring Equipment	6
Active Networks for Test Purposes	7
Time Measuring and Counting Equipment	8
Nuclear Energy Test and Measuring Equipment	9
Multifunction Test and Measuring Equipment	10
Associated Devices for Test and Measuring Equipment	11
Passive Networks for Test Purposes	12
Standards and Calibration Equipment for Test and Measuring Equipment	13
Power and Energy Measuring Equipment	14
Temperature Indicating, Measuring, and Recording Equipment	15
Stress, Strain and Flaw Detecting and Measuring Equipment	16
Gas and/or Liquid Measuring and Analyzing Equipment	17
Kinematic Test and Measuring Equipment	18
Optical Testing, Measuring and Aligning Equipment	19

ELECTRONICS TEST EQUIPMENT
FUNCTIONAL CLASSIFICATION

10. MULTIFUNCTION TEST AND MEASURING EQUIPMENT

- 10.1 Combination and/or Group Test Set
    - 10.1.1 Frequency Meter - Power Meter Test Set
    - 10.1.2 Signal Generator - Frequency Meter Test Set
    - 10.1.3 Signal Generator - Frequency Meter - Power Meter Test Set
    - 10.1.4 Signal Generator - Power Meter Test Set
    - 10.1.5 Frequency Meter - Voltage and/or Current Meter Test Set
    - 10.1.6 Waveform Measuring - Time Base Measuring Test Set
    - 10.1.7 Electronic Switch - Square Wave Generator Test Set
    - 10.1.8 Signal Generator - VSWR Meter Test Set
    - 10.1.9 Signal Generator - Field Strength Meter Test Set
    - 10.1.10 Signal Generator - Stalo Jitter Tester Test Set (MTI Evaluator)
    - 10.1.11 Multimeter - Power Meter Test Set
    - 10.1.12 Signal Tracer - Tester Test Set
    - 10.1.13 Infrared Signal Generator - Detector Test Set
- 10.2 Component Test Set
    - 10.2.1 Gyro Instrument Test Equipment
    - 10.2.2 Synchro Test Equipment
    - 10.2.3 Dynamotor and Motor Generator Test Equipment
    - 10.2.4 Vibrator and Inverter Test Equipment
    - 10.2.5 Commutator Test Equipment
    - 10.2.6 Relay Test Equipment
    - 10.2.7 Electron Tube Test Equipment
    - 10.2.8 Crystal Rectifier and Transistor Test Equipment
    - 10.2.9 Quartz Crystal Test Equipment

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ELECTRONICS TEST EQUIPMENT FUNCTIONAL CLASSIFICATION

- 10.3 Assembly and Subassembly Test Equipment
  - 10.3.1 Power Supply Maintenance Test Equipment
  - 10.3.2 Telephone Instrument Test Equipment
  - 10.3.3 Telegraph and Teletypewriter Test Equipment
  - 10.3.4 Test Bench
  - 10.3.5 Power Distribution Panel Test Equipment
- 10.4 System and Operational Test Equipment
  - 10.4.1 Servo Test Set
  - 10.4.2 Computer Test Set
  - 10.4.3 Wire, Cable, and Harness Test Equipment
  - 10.4.4 Test Stand and Control Equipment
  - 10.4.5 Operational Indicator
  - 10.4.6 Television System Test Equipment
  - 10.4.7 Telegraph, Teletypewriter, and Telephone System Test Equipment
  - 10.4.8 Radar System Harmonization and Boresighting Equipment
  - 10.4.9 Weapon Harmonization and Boresighting Equipment
  - 10.4.10 Gun-Bomb-Rocket Sight-Alignment Equipment
  - 10.4.11 Radar System Checkout Equipment

ELECTRONICS TEST EQUIPMENT
FUNCTIONAL CLASSIFICATION - DEFINITIONS

10. MULTIFUNCTION TEST AND MEASURING EQUIPMENT

An equipment used to perform two or more test or measurement functions.

10.1 COMBINATION AND/OR GROUP TEST SETS

An equipment consisting of separate components, contained in one or more cases, which performs two or more test functions. The components of the equipment may be separately nomenclatured.

10. 1. 1 FREQUENCY METER - POWER METER TEST SET

An equipment consisting of a frequency meter and a power meter contained in a single case or connected by cables.

10. 1. 2 SIGNAL GENERATOR - FREQUENCY METER TEST SET

An equipment consisting of a signal generator and a frequency meter contained in a single case or connected by cables.

10. 1. 3 SIGNAL GENERATOR - FREQUENCY METER - POWER METER TEST SET

An equipment consisting of a signal generator, a frequency meter, and a power meter contained in a single case or connected by cables.

10. 1. 4 SIGNAL GENERATOR - POWER METER TEST SET

An equipment consisting of a signal generator and a power meter in a single case or connected by cables.

10. 1. 5 FREQUENCY METER - VOLTAGE AND/OR CURRENT METER TEST SET

An equipment consisting of a frequency meter and voltage and/or current measuring equipment contained in a single case or connected by cables.

10. 1. 6 WAVEFORM MEASURING - TIME BASE MEASURING TEST SET

An equipment consisting of both waveform and time base measuring equipment contained in a single case or connected by cables.

10. 1. 7 ELECTRONIC SWITCH - SQUARE WAVE GENERATOR TEST SET

An equipment consisting of an electronic switch and a square wave generator in a single case or connected by cables. The equipment includes signal amplifiers.

ELECTRONICS TEST EQUIPMENT
FUNCTIONAL CLASSIFICATION - DEFINITIONS

10.1.8 SIGNAL GENERATOR - VSWR METER TEST SET

An equipment consisting of a signal generator and a VSWR meter in a single case or connected by cables.

10.1.9 SIGNAL GENERATOR - FIELD STRENGTH METER TEST SET

An equipment consisting of a signal generator and a field strength meter in a single case or connected by cables.

10.1.10 SIGNAL GENERATOR - STALO JITTER TESTER TEST SET (MTI EVALUATOR)

An equipment consisting of MTI evaluator equipments in a single case or connected by cables.

10.1.11 MULTIMETER - POWER METER TEST SET

An equipment consisting of a multimeter and a power meter in a single case or connected by cables.

10.1.12 SIGNAL TRACER - TESTER TEST SET

An equipment consisting of a signal tracer and a tester in a single case or connected by cables.

10.1.13 INFRARED SIGNAL GENERATOR - DETECTOR TEST SET

An equipment consisting of an infrared signal generator and a detector in a single case or connected by cables.

10.2 COMPONENT TEST SET

An equipment specifically designed to perform multiple tests on a particular integral part or completed integral unit.

10.2.1 GYRO INSTRUMENT TEST EQUIPMENT

An equipment specifically designed to perform tests on gyro instruments.

10.2.2 SYNCHRO TEST EQUIPMENT

A device used to test and/or adjust Selsyn generators, Selsyn control transformers, and differential Selsyns.

10.2.3 DYNAMOTOR AND MOTOR GENERATOR TEST EQUIPMENT

An equipment used to test and/or adjust dynamotor and motor generator equipment for electrical and mechanical characteristics.

ELECTRONICS TEST EQUIPMENT
FUNCTIONAL CLASSIFICATION - DEFINITIONS

10.2.4 VIBRATOR AND INVERTER TEST EQUIPMENT

A device used to test and/or adjust vibrators and inverters for electrical and mechanical characteristics.

10.2.5 COMMUTATOR TEST EQUIPMENT

A device designed to test and adjust commutators for electrical characteristics.

10.2.6 RELAY TEST EQUIPMENT

An equipment specifically designed for examining and adjusting the operation of relays.

10.2.7 ELECTRON TUBE TEST EQUIPMENT

A device used to indicate the condition of an electron tube by measuring such characteristics as: cathode emission, mutual conductance, internal shorts, etc.

10.2.8 CRYSTAL RECTIFIER AND TRANSISTOR TEST EQUIPMENT

A device designed to measure properties of crystal rectifiers and/or transistors.

10.2.9 QUARTZ CRYSTAL TEST EQUIPMENT

An equipment specifically designed to determine the resonant frequency and/or the impedance of quartz crystals.

10.3 ASSEMBLY AND SUBASSEMBLY TEST EQUIPMENT

An equipment specifically designed to test a major part of a system.

10.3.1 POWER SUPPLY MAINTENANCE TEST EQUIPMENT

An equipment specifically designed for testing and maintaining electrical power supply sets.

10.3.2 TELEPHONE INSTRUMENT TEST EQUIPMENT

An equipment specifically designed to test telephone instruments. This does not include test equipment for telephone systems which is covered in 10.4.7.

10.3.3 TELEGRAPH AND TELETYPEWRITER TEST EQUIPMENT

An equipment specifically designed to test telegraph and/or teletypewriter equipment. This covers individual items of equipment and does not include systems as defined in 10.4.7.

ELECTRONICS TEST EQUIPMENT FUNCTIONAL CLASSIFICATION - DEFINITIONS

10.3.4 TEST BENCH

An equipment specifically designed to make overall bench tests on equipment in a particular test set up under controlled conditions.

10.3.5 POWER DISTRIBUTION PANEL TEST EQUIPMENT

An instrument designed to perform multiple tests on control panels and components.

10.4 SYSTEM AND OPERATIONAL TEST EQUIPMENT

An equipment specifically designed to perform operational tests on complete systems or networks of assemblies and components

10.4.1 SERVO TEST SET

An equipment specifically designed for making examinations of servomechanisms.

10.4.2 COMPUTER TEST SET

An equipment specifically designed for examination of the overall operation of a computer.

10.4.3 WIRE, CABLE, AND HARNESS TEST EQUIPMENT

An equipment specifically designed to measure the characteristics of, and/or the distortion introduced by wires, cables, and electrical harness assemblies.

10.4.4 TEST STAND AND CONTROL EQUIPMENT

An equipment specifically designed to provide suitable mountings, connections, and controls for testing electrical equipment as an entire system.

10.4.5 OPERATIONAL INDICATOR

An equipment specifically designed to determine solely whether or not an equipment is operational.

10.4.6 TELEVISION SYSTEM TEST EQUIPMENT

An equipment specifically designed to test the performance characteristics of television systems.

10.4.7 TELEGRAPH, TELETYPEWRITER, AND TELEPHONE SYSTEM TEST EQUIPMENT

An equipment specifically designed to test the performance characteristics of telegraph, teletypewriter, and telephone systems. This does not include test equipment for making tests on individual instruments as covered in 10.3.2 and 10.3.3.

10.4.8 RADAR SYSTEM HARMONIZATION AND BORESIGHTING EQUIPMENT

Equipment designed to align the electrical axis of radar with the mechanical axis and to align these axes with those of other equipment.

10.4.9 WEAPON HARMONIZATION AND BORESIGHTING EQUIPMENT

An equipment designed to align the axis of weapons and weapon components with respect to the axis of the weapon carrier and of other weapon system components.

10.4.10 GUN-BOMB-ROCKET SIGHT-ALIGNMENT EQUIPMENT

A device designed to align and adjust aircraft weapons sighting equipment.

10.4.11 RADAR SYSTEM CHECKOUT EQUIPMENT

A combination of test equipments capable of performing overall operational tests on a complete radar system.

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10. 1	TS-313/U	Test Set	73
10. 1	TS-355/UP	Test Set	77
10. 1	TS-364/APX-15	Test Set	81
10. 1. 1	AN/SPM-4	Frequency-Power Meter	85
10. 1. 1	TS-3/AP	Test Set	89
10. 1. 1	TS-3A/AP	Test Set	93
10. 1. 1	TS-23/APN	Test Set	97
10. 1. 1	TS-107/TPM-1	Wave and Power Meter Set	101
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10. 1. 1	Friez CA-2520	Frequency Measuring Unit and Pulse Power Detector	109
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10. 1. 2	AN/TRM-3(XN)	Radio Test Set	115
10. 1. 2	BC-376-A	Test Oscillator	119
10. 1. 2	BC-376-B	Test Oscillator	121
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10. 1. 3	AN/UPM-44(XN-1)	Radar Test Set	253
10. 1. 3	AN/UPM-56	Radar Test Set	257
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10. 1. 3	TS-120/UP	Test Set	301
10. 1. 3	TS-147/UP	Test Set	305
10. 1. 3	TS-147A/UP	Test Set	309
10. 1. 3	TS-147D/UP	Test Set	313
10. 1. 3	TS-191/UP	Test Set	317
10. 1. 3	TS-223/AP	Test Set	321
10. 1. 3	TS-259/AP	Signal Generator	325
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10. 1. 3	TS-538/U	Test Set	333
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10. 1. 8	Sperry 539	Detector, Standing Wave 405
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10.2 COMPONENT TEST SETS

Functional Classification	Designation	Name	
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I-86-A	Test Unit	10.1.2
I-100-A	Test Set	10.2
I-100-B	Test Set	10.2
I-142-A	Test Set	10.4.7
I-157-A	Test Set	10.1
I-177	Tube Tester	10.2.7
I-177-A	Tube Tester	10.2.7
I-177-B	Tube Tester	10.2.7
I-181-B	Test Set	10.2.6
I-193-C	Test Set	10.2.6
I-209-B	Test Set	10.1.5
I-222-A	Signal Generator	10.1.2
I-231	Alignment Test Set	10.4.6
I-232	Fluorescent Projector	10.4.6
ID-66/AXR-1	Monitor Indicator	10.4.6
ID-253/GRD	Azimuth Indicator	10.3
IE-12-A	Test Equipment	10.1.9
IE-17-F	Test Equipment	10.4.4
IE-19-A	Test Equipment	10.1.9

ALPHA-NUMERICAL INDEX (Continued)

Designation	Name	Functional Classification
IE-36	Test Equipment	10. 3. 4
IE-56-A	Test Equipment	10. 1
IE-56-B	Test Equipment	10. 1
J-229/ARN-14	Junction Box	10. 4. 4
LT-3080	Test Panel, Servo Motor Assembly	10. 4. 1
LT-3089A	Analyzer, Electron Tube	10. 2. 7
MA-1	Test Set, Range Servo	10. 4. 1
MX-479/ARN-6	Adapter Kit	10. 4. 4
MX-799/APG-3	Boresighting Accessory Kit	10. 4. 8
MX-799A/APG-3	Boresighting Accessory Kit	10. 4. 8
O-14/FSM-1	Oscillator	10. 2. 9
OCP-3	Sonar Test Equipment	10. 1. 3
R-206A/PR	Radio Receiver	10. 4
R-270/FRR	Radio Receiver	10. 4
RC-54-A	Test Set	10. 3. 4
RC-54-B	Test Set	10. 3. 4
RC-54-C	Test Set	10. 3. 4
RC-55-A	Test Set	10. 3. 4
RC-55-B	Test Set	10. 3. 4
RC-55-C	Test Set	10. 3. 4
RP-106/GPH	Signal Data Reproducer	10. 4
SG-27(XW)/U	RF Signal Generator	10. 1. 2
SG-58A/U	Pulse Generator	10. 2. 7
SM-26/U	Antenna Postion Simulator	10. 2. 2
SM-65/UP	Radar Signal Simulator	10. 1. 10
TS-2/TG	Test Set	10. 4. 7
TS-3/AP	Test Set	10. 1. 1

ALPHA-NUMERICAL INDEX (Continued)

Designation	Name	Functional Classification
TS-3A/AP	Test Set	10.1.1
TS-13/AP	Radio Frequency Test Set	10.1.3
TS-14/AP	Test Set	10.1.3
TS-14A/AP	Test Set	10.1.3
TS-16/APN	Test Set	10.1.2
TS-16X/APN	Test Set	10.1.2
TS-23/APN	Test Set	10.1.1
TS-27B/TSM	Test Set	10.4.7
TS-35/AP	Signal Generator	10.1.3
TS-35A/AP	Signal Generator	10.1.3
TS-41/CRN-1	Test Set	10.1.5
TS-45/APM-3	Radar Test Set	10.1.3
TS-45A/APM-3	Radar Test Set	10.1.3
TS-92/AP	Amplifier Alignment Unit	10.3
TS-107/TPM-1	Wave and Power Meter Set	10.1.1
TS-120/UP	Test Set	10.1.3
TS-140/PCM	Test Set	10.1.4
TS-147/UP	Test Set	10.1.3
TS-147A/UP	Test Set	10.1.3
TS-147D/UP	Test Set	10.1.3
TS-154/CRW-2	Test Box	10.2.6
TS-155/UP	Signal Generator	10.1.4
TS-155A/UP	Signal Generator	10.1.4
TS-155B/UP	Signal Generator	10.1.4
TS-155C/UP	Signal Generator	10.1.4
TS-161/AI	Test Set	10.4.7
TS-162/AI	Test Set	10.4.7

ALPHA-NUMERICAL INDEX (Continued)

Designation	Name	Functional Classification
TS-163/AI	Test Set	10. 4. 7
TS-183A/U	Battery Tester	10. 2
TS-190/U	Test Set, Telephone	10. 4. 7
TS-191/UP	Test Set	10. 1. 3
TS-193B/CPM-4	Dummy Transmit-Receive Box	10. 4. 11
TS-203/AP	Test Indicator	10. 2. 2
TS-215/AP	Phasing Analyzer	10. 2. 2
TS-223/AP	Test Set	10. 1. 3
TS-230C/AP	Frequency-Power Meter	10. 1. 1
TS-233/TPN-2	Test Set	10. 1. 2
TS-257/ARW	Test Set	10. 2. 6
TS-257A/ARW	Test Set	10. 2. 6
TS-259/AP	Signal Generator	10. 1. 3
TS-259A/AP	Signal Generator	10. 1. 3
TS-268/U	Crystal Rectifier Test Set	10. 2. 8
TS-268B/U	Crystal Rectifier Test Set	10. 2. 8
TS-268C/U	Crystal Rectifier Test Set	10. 2. 8
TS-268D/U	Crystal Rectifier Test Set	10. 2. 8
TS-268E/U	Crystal Rectifier Test Set	10. 2. 8
TS-295A/UP	Frequency-Power Meter	10. 1. 1
TS-313/U	Test Set	10. 1
TS-326A/U	Test Oscillator	10. 1. 2
TS-326B/U	Test Oscillator	10. 1. 2
TS-330/TSM	Crystal Impedance Meter	10. 2. 9
TS-355/UP	Test Set	10. 1
TS-364/APX-15	Test Set	10. 1
TS-383A/GG	Distortion Test Set	10. 4. 7

ALPHA-NUMERICAL INDEX (Continued)

Designation	Name	Functional Classification
TS-397/U	Test Set	10.2.7
TS-414/U	Dynamotor Test Set	10.2.3
TS-414A/U	Dynamotor Test Set	10.2.3
TS-433B/U	Electronic Switch	10.1.7
TS-452/U	Signal Generator	10.1.2
TS-452A/U	Signal Generator	10.1.2
TS-452B/U	Signal Generator	10.1.2
TS-452C/U	Signal Generator	10.1.2
TS-456/CRN-1A	Test Set	10.1.5
TS-477/APN-19	Test Set	10.4.11
TS-522/CRT-3	Test Set	10.1.11
TS-535/U	Signal Generator	10.1.2
TS-535A/U	Signal Generator	10.1.2
TS-537/TSM	Crystal Impedance Meter	10.2.9
TS-538/U	Test Set	10.1.3
TS-541/TPS	Test Set	10.1.3
TS-546/U	Crystal Test Set	10.2.9
TS-559A/FT	Transmission Measuring Set	10.4.7
TS-577/FG	Telegraph Monitor	10.4.7
TS-602(XA)/U	Signal Generator	10.1.3
TS-604/U	Relay Test Set	10.2.6
TS-604A/U	Relay Test Set	10.2.6
TS-605/U	Relay Test Set	10.2.6
TS-611/FG	Teletypewriter Test Set	10.4.7
TS-627/U	Power Test Set	10.1.11
TS-652/GG	Teletypewriter Test Set	10.4.7
TS-653/APG	Synchro Phasing Tester	10.2.2

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Designation	Name	Functional Classification
TS-653A/APG	Synchro Phasing Tester	10.2.2
TS-657/FG	Teletypewriter Test Set	10.4.7
TS-658/UG	Teletypewriter Test Set	10.4.7
TS-659/UG	Teletypewriter Test Set	10.4.7
TS-660/UG	Teletypewriter Test Set	10.4.7
TS-666/AP	Computer Calibrator	10.3
TS-666A/AP	Computer Calibrator	10.3
TS-667/AP	Computer Test Set	10.3
TS-667A/AP	Computer Test Set	10.3
TS-673A/U	Signal Tracer	10.1.12
TS-676/U	Transmission Line Fault Locator	10.4.7
TS-677(XW)/UP	Moving Traget Indicator Evaluator Set	10.1.10
TS-683/TSM	Crystal Impedance Meter	10.2.9
TS-697/U	Stalo Stability Tester	10.1.10
TS-710(XS)/TSM	Crystal Impedance Meter	10.2.9
TS-712/TCC-11	Test Set. Telephone	10.3.2
TS-713/U	Synchro Test Set	10.2.2
TS-714/U	Synchro Alignment Set	10.2.2
TS-724/SAC	Infrared Test Set	10.1.13
TS-743/UPM	Radar Test Set	10.1.3
TS-750/URM	Stethoscope	10.1.12
TS-788/A	Magnetic Compass Alignment Set	10.2
TS-816/U	Test Set, Telephone	10.4.3
TS-897/U	Test Set, Electrical Power	10.2.3
TS-1100/U	Transistor Tester	10.2.8
TV-2/U	Test Set, Electron Tube	10.2.7
TV-3A/U	Tube Tester	10.2.7

ALPHA-NUMERICAL INDEX (Continued)

Designation	Name	Functional Classification
TV-3B/U	Tube Tester	10. 2. 7
TV-4A/U	Tube Tester	10. 2. 7
TV-6(XE)/U	Electron Tube Test Set	10. 2. 7
TV-7/U	Test Set, Electron Tube	10. 2. 7
AC Spark Plug RTL-5351	Tester, Preflight	10. 4. 10
Airborne 390A-3	Test Set, Crystal Checker	10. 2. 8
Aircraft Radio Corp. 16100	Bench Test Kit	10. 4
Cal-Tronics 10949	Test Set, Roll Servo	10. 4. 1
Cal-Tronics 10983	Test Set, Terminal Box	10. 2
Cal-Tronics 210739	Test Set, Antenna Hand Control	10. 2. 2
Cal-Tronics 210740	Test Set, Indicator, Power Supply	10. 3. 1
Cal-Tronics 210743	Test Set, Roll and Pitch Control	10. 2. 1
DIT-MCO 200	Circuit Analyzer	10. 2
DYMEC DY-623B	Signal Generator	10. 1. 3
Eclipse-Pioneer 13251-1-A	Transformer, Zero-Setting	10. 2. 2
Eclipse-Pioneer 13618-3-A	Control, Servo Test	10. 4. 1
Eclipse-Pioneer 13632-1A-A	Test Indicator, Magnesyn	10. 2. 2
Eclipse-Pioneer 13643-1-A	Tester, Autosyn	10. 2. 2
Eclipse-Pioneer 13644-1-A	Tester	10. 2. 2
Eclipse-Pioneer 13647-1-A	Indicator	10. 2. 2
Eclipse-Pioneer 13669-2-A	Field Tester, Synchro Instrument	10. 2. 2
Eclipse-Pioneer 13681-1-A	Test Control, Servo	10. 4. 1
Eclipse-Pioneer 13700-1-A	Tester, Insulation	10. 4. 5
Eclipse-Pioneer 13824-1-A	Test Set, Power Supply	10. 3. 1
Eclipse-Pioneer 13850-1-A	Test Set, Proportional Voltage	10. 2. 2
Ford Instrument NSA-2	Tester, Power Supply	10. 3. 1
Ford Instrument NSA-4	Tester, Alignment	10. 2

ALPHA-NUMERICAL INDEX (Continued)

Designation	Name	Functional Classification
Friez CA-2520	Frequency Measuring Unit and Pulse Power Detector	10. 1. 1
General Electric 141D617G1	Panel Gyro Test Bench	10. 2. 1
General Electric 142D557G1	Stand Assembly, Collimating	10. 4. 8
General Electric 144D429G1	Tester, Amplifier Gain and Balance	10. 3
General Electric 211A855P-1	Bellows Leveler	10. 2
General Electric 519E645G1	Turntable, Ten Speed	10. 2. 1
*General Electric 141D618G1	Panel, Turntable Control	10. 2. 1
*General Electric 141D283G1	Fixture, Band Setting	10. 2. 1
General Electric 9076040G2	Dummy Director	10. 3
General Electric 9161931G1	Lead Checker	10. 2. 1
General Electric 9628924G1	Electrical Computer Tester	10. 4. 2
General Electric 9797134G1	Computer Tester	10. 4. 2
General Mills TSY-7028	Fixture, Desiccator Pump Test	10. 2
General Mills TSY-7030	Gage and Adapter, Pressure Test	10. 4. 10
General Mills TSY-7071	Fixture, Backlash Checking	10. 3
General Mills TSY-7107	Tester, Coordinate Converter	10. 3
General Mills TSY-7111	Fixture, Y-4 Troubleshooting	10. 4. 1
General Mills TSY-7112	Tester Servo Amplifier	10. 3
General Radio 1661-A	Bridge, Vacuum Tube	10. 2. 7
Hewlett-Packard 624A	Signal Generator	10. 1. 3
Hickok 539B	Tube Tester	10. 2. 7
Hickok 547A	Tube Tester	10. 2. 7
Hughes 404000-110	Test Bench, Maintenance (Complete)	10. 3. 4

* Combined on one sheet.

ALPHA-NUMERICAL INDEX (Continued)

Designation	Name	Functional Classification
Hughes 404000-111	Test Bench, Maintenance	10.3.4
Hughes 404000-112	Test Bench, Maintenance (Complete)	10.3.4
Hughes 413011-100	Test Set, Computer Air Data	10.2
Hughes 486005-110	Tester, Pressure Transducer	10.4.2
Hughes 486094-100	Test Set, Computer Service and Alignment, Type MA-1	10.4.2
Hughes 486095-100	Assembly, Cable, Type MA-1, with Carrying Case	10.4.2
Hughes 486196-110	Test Set, Radar Tracking Loop	10.4.1
Hughes 486396-100	Test Set, Radar, Pressurization	10.4.11
Kollsman TE5694	Indicator, Mach Number, Repeater	10.3
Kollsman TE5696	Indicator, True Airspeed, Repeater	10.3
Kollsman TE5709	Indicator, Servo	10.2.2
Kollsman TE5711	Switch, Synchro Null Check	10.2.2
Kollsman TE5712	Switch, Electrical Zero Check	10.3
Kollsman TE5713, TE5714	Switch, Selector	10.3
Kollsman TE5717	Switch, Resistance Selector	10.4.2
Kollsman TE5727	Tester, Amplifier	10.3
Kollsman TE5728	Tester, Power Supply	10.3.1
Lavoie LA-302	Robotester	10.2
Lear LT-3213	Test Panel, Rate Gyro	10.2.1
Lockheed 453352-6	Target Harmonization and Boresight	10.4.9
Lockheed 458535	Tester, Intervalometer Circuit	10.4.5
Maxson E66228	Test Unit Assembly, Timer	10.4.2
Maxson E66229	Test Unit Assembly	10.4.2
Measurements 59	Megacycle Meter	10.1.2
Micro Balancing EU-2	Dynamic Balancer	10.2

ALPHA-NUMERICAL INDEX (Continued)

Designation	Name	Functional Classification
Minneapolis-Honeywell HT163-A	Tester, Rate Gyro Calibrating	10. 2. 1
Minneapolis-Honeywell HT170	Wobble Table	10. 2. 1
Minneapolis-Honeywell HT171	Turntable, Rate Gyro	10. 2. 1
Minneapolis-Honeywell HT174	Tester, Vertical Gyro Precession	10. 2. 1
Minneapolis-Honeywell HT253	Drill Jig, Vertical Gyro Rotor	10. 2. 1
Minneapolis-Honeywell HT275	Drill Jig, Rate Gyro Rotor	10. 2. 1
Minneapolis-Honeywell UG25A-1	Tester, Gyro Electrical	10. 2. 1
Minneapolis-Honeywell UG47A-1	Tester-Amplifier Electrical Compass Coupler	10. 3
Minneapolis-Honeywell UG48A-1	Tester-Amplifier Electrical	10. 3
Minneapolis-Honeywell UG58A-1	Calibrator, Bellows Travel	10. 2
Minneapolis-Honeywell UG59A-1	Controller, Variable Air Pressure	10. 2
Minneapolis-Honeywell UG61A-1	Tester, Sense Unit, Calibration	10. 3
Minneapolis-Honeywell UG63A-1	Tester-Flight Controller, Electrical	10. 2
Minneapolis-Honeywell UG66A-1	Tester-Electrical Signal Motor	10. 2. 3
Minneapolis-Honeywell UG89A-1	Tester, Followup Motor, Electrical	10. 2. 3
Minneapolis-Honeywell UG98A-1	Tester, Mockup, Altitude Control	10. 3. 4

ALPHA-NUMERICAL INDEX (Continued)

Designation	Name	Functional Classification
Minneapolis-Honeywell UG99A-1	Tester, Amplifier, Electrical	10. 3
Minneapolis-Honeywell UG115A-1	Tester, Bellows, Area Compensation	10. 2
Minneapolis-Honeywell UG117A-1	Tester, Altitude Control	10. 2
Minneapolis-Honeywell UG126A-1	Tester-Motor, Electrical	10. 2. 3
Minneapolis-Honeywell UG136A-1	Tester-Flight Controller Torque and Displacement	10. 2
Minneapolis-Honeywell UG145A-1	Tester	10. 4
Minneapolis-Honeywell UG147A-1	Fixture, Run-In Signal Control Motor	10. 2. 3
Minneapolis-Honeywell UG149A-1	Tester, Pedal Force Transducer, Electrical	10. 2
Minneapolis-Honeywell UG150A-1	Calibrator-Altitude Compensator	10. 3
Minneapolis-Honeywell UG152A-1	Tester, Altitude Compensator, Electrical	10. 2
Minneapolis-Honeywell UG153A-1	Tester, Field, Autopilot System	10. 4
Minneapolis-Honeywell UG154A-1	Bench, Flyaway, MH-11C1 Autopilot	10. 3. 4
Minneapolis-Honeywell UG182A-1	Tester-Adapter, Altitude Trim Electrical	10. 3
Minneapolis-Honeywell UG189A-1	Tester, Airspeed Compensator Electrical	10.3
Minneapolis-Honeywell UG190A -1	Fixture, Run-In, Control Motor	10. 2. 3
Minneapolis-Honeywell UG198A-1	Bench, Flyaway, MH-11C2 Autopilot	10. 3. 4

ALPHA-NUMERICAL INDEX (Continued)

Designation	Name	Functional Classification
Minneapolis-Honeywell UG201A-1	Tester, Integrator, Electrical	10. 3
Minneapolis-Honeywell UG204A-1	Tester-Field Preflight Electrical LABS	10. 4. 2
Minneapolis-Honeywell UG205A-1	Tester, Mockup, Electrical LABS	10. 4. 2
Minneapolis-Honeywell UG213A-1	Tester, Sector Switch	10. 2
North American 11118-307	Comparator, Voltage and Phase	10. 4
North American 15412-305	Test Set, Computer Plug-In System	10. 3
Northrop N-1703-500	Assembly, Rocket Test Stand	10. 4. 4
Philco 463-2338-1, -2, -3	Test Set, Microwave, RF	10. 1. 3
Servomechanisms RST 104	Test Set	10. 4. 1
Sikorsky S1670-10070	Line Maintenance Tester	10. 4. 5
Sperry T-100060	Scorsby Base	10. 2. 1
Sperry T-100719	Table, Tilt-Turn	10. 2. 1
Sperry T-100767	Cable Tester	10. 4. 3
Sperry T-100803	Analyzer, Vertical Gyro and Compass Control	10. 2. 1
Sperry T-100812	Amplifier Analyzer	10. 3
Sperry T-100844	Servo System Analyzer	10. 4. 1
Sperry T-100881	System Analyzer	10. 4. 10
Sperry T-100884	Computer Analyzer	10. 4. 10
Sperry T-100895	Amplifier Analyzer	10. 3
Sperry T-100909	Analyzer-Turn Generator	10. 2. 2
Sperry T-100925	Table, Scorsby	10. 2. 1
Sperry T-101001	Stabilization Tester Assembly	10. 3
Sperry T-101002	Tester, Amplifier	10. 3
Sperry T-101003	Synchro Signal Tester	10. 2. 2

ALPHA-NUMERICAL INDEX (Continued)

Designation	Name	Functional Classification
Sperry T-101008	Control Assembly-Tracking Computer	10.4.2
Sperry T-101009	Component Resolver Tester Assembly	10.4.2
Sperry T-101013	Gyro Turntable	10.2.1
Sperry T-101018	Meter Unit Tester Assembly	10.3
Sperry T-101020	Synchro Zeroing Tester Assembly	10.2.2
Sperry T-101021	Transmitter, Assembly, Data	10.2.2
Sperry T-101023	Data Repeater Indicator	10.3
Sperry T-101024	Transmitter, Dummy T.A.S. and ALT.	10.4.2
Sperry T-101025	Tester Assembly, Navigational Control	10.3
Sperry T-101027	Compass Swinging Tester	10.2.2
Sperry T-101031	Master Synchro Tester Assembly	10.2.2
Sperry T-101043	Servo Motor Control Assembly	10.4.1
Sperry T-101046	Analyzer, Navigational Control	10.2.2
Sperry T-101052	Bombing Computer Analyzer	10.4.2
Sperry T-101055	Analyzer-Polar Converter	10.2
Sperry T-101058	Stabilization Unit Analyzer	10.3
Sperry T-101061	Azimuth Computer Tester	10.4.2
Sperry T-101065	Tester, Clutch Torque	10.2
Sperry T-101071	Fixture, V.S.D. Test	10.2
Sperry T-101075	Analyzer, Pedestal Generator, I.C.E.	10.2
Sperry T-101076	Analyzer, Phase Shift	10.2
Sperry T-101077	Analyzer, Range Servo Amplifier, I.C.E.	10.3
Sperry T-101078	Analyzer, I.C.E. Range Azimuth Indicator	10.2

ALPHA-NUMERICAL INDEX (Continued)

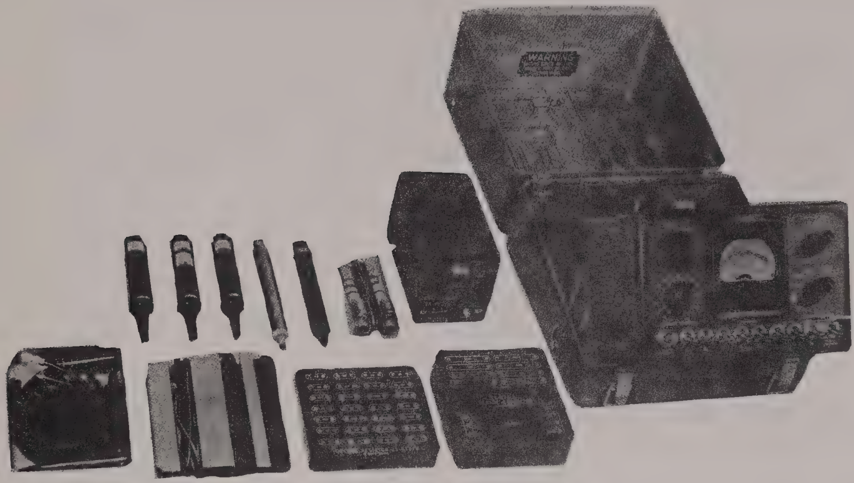
Designation	Name	Functional Classification
Sperry T-101079	Azimuth Generator Analyzer	10. 3
Sperry T-101081	PPI Offset Analyzer	10. 3
Sperry T-101086	AC Servo Control Panel	10. 4. 1
Sperry T-101097	Control Panel, DC Servo	10. 2. 3
Sperry T-101100	Panel, System Test	10. 3. 4
Sperry T-101101	Dummy Radar Fixture	10. 4. 2
Sperry T-101103	Rack, Junction Box	10. 3. 4
Sperry T-101105	Fixture, Dummy Autopilot and Heading Transmitter	10. 3
Sperry T-101144	Analyzer, High Voltage Supply	10. 3. 1
Sperry T-101145	Analyzer-Power Supply	10. 3. 1
Sperry T-101153	Stabilization Data Repeater	10. 4. 2
Sperry T-101234	Magnetic Variation Cam Static Test Fixture	10. 2. 2
Sperry T-101251	Computer Simulator	10. 4. 11
Sperry T-101270	Fixture, Amplifier Aging and Testing	10. 3
Sperry T-101271	Fixture, Amplifier Aging and Testing	10. 3
Sperry T-101272	Fixture, Amplifier Aging and Testing	10. 3
Sperry T-101273	Fixture, Amplifier Aging and Testing	10. 3
Sperry T-101274	Fixture, Amplifier Aging and Testing	10. 3
Sperry T-101275	Fixture, Amplifier Aging and Testing	10. 3
Sperry T-101276	Fixture, Amplifier Aging and Testing	10. 3
Sperry T-101278	SA, CA, and Turn Generator Fixture	10. 2
Sperry T-101286	Tester, Multiplier Assembly	10. 3
Sperry T-101439	Stand, Roll Stabilization	10. 3
Sperry 539	Detector, Standing Wave	10. 1. 8
Sperry 1,000,005	Turntable-Computer Portable	10. 4. 2
Sperry 1,000,014	Turntable-Computer	10. 4. 2

ALPHA-NUMERICAL INDEX (Continued)

Designation	Name	Functional Classification
Sperry 1,000,034	Analyzer-Amplifier	10.3
Sperry 1,000,036	Analyzer, Computer	10.3
Sperry 1,000,041	Analyzer System	10.4.10
Sperry 1,000,042	Analyzer, Sight Head	10.3
Sperry 1,000,049	Analyzer, Turn Controller	10.3
Sperry 1,000,117	Voltage Comparator	10.2.2
Sperry 1,000,132	Safety Monitor Amplifier Analyzer	10.2
Sperry 1,000,179	Polar Navigation Control Analyzer	10.2
Sperry 1,000,181	AC Servo Motor Test Stand and Adapter	10.2
Sperry 1,000,273	Control, Radar Set	10.4.11
Sperry 1,000,300	Analyzer, Flight Controller	10.3
Sperry 1,000,307	Analyzer, Altitude Control Assembly	10.3
Sperry 1,000,309	Analyzer, Autopilot Amplifier	10.2
Sperry 1,000,323	Analyzer, Turn Generator	10.2
Sperry 1,000,324	Generator, Signal, Variable Rate	10.4.1
Teletronics DT-100A	Diode Tester	10.2.9
Teletronics DT-257	Diode Test Set	10.2.9
Teletype 14	Monitoring Printer	10.3.3
Western Electric 111A2	Relay Test Set	10.2.6

10. 1 COMBINATION AND/OR GROUP TEST SETS

TEST-TOOL SET AN/USM-3B



FUNCTIONAL DESCRIPTION:

A portable, general purpose, self-contained kit assembly of tools and test equipments designed for emergency test and repair of electronic and electrical equipment and for general service work. The test set is used for measuring capacitance; measuring audio frequency and audio-frequency-modulated RF and IF signals; testing RF amplifiers; locating and generating radio interference; measuring gain through AF and RF amplifiers; testing continuity of electrical, AF and low level RF lines; measuring line voltages and polarity of DC voltages; measuring resistance; and testing the condition of electron tubes.

RELATIONSHIP TO OTHER EQUIPMENT:

The AN/USM-3B is similar to and functionally interchangeable with AN/USM-3A except for minor design changes in the signal tracer, and for the multimeter test prod which combines the functions of Test Prod ID-263/U, ID-264/U, and ID-265/U into one unit. The AN/USM-3A is similar to and interchangeable with the AN/USM-3 and differs only in minor design changes in the components.

	AIR FORCE	NAVY	ARMY
TYPE CLASS.			
STOCK NOS.			
PROCUREM'T INFO.:			
PROCUREM'T COG.: Navy		DESIGN COG.:	Navy, BuShips
F.I.I.N.:		FUNCTIONAL CLASS. NO.:	10.1

TEST-TOOL SET AN/USM-3B

ELECTROMECHANICAL DESCRIPTION:

Circuit Information: The assembly consists of 8 major test units. For information pertaining to the individual equipments, refer to the respective descriptive data sheet. The major test units of the assembly are as follows:

Test Unit	Volume
ID-604/U Multimeter Test Prod	11
MX-933/U Test Prod	11
MX-934/U Test Prod	11
SG-23/U Interference Generator	4
TS-671/U Decade Capacitor	12
TS-672A/U Decade Resistor	12
TS-673A/U Signal Tracer	10
TV-4A/U Tube Tester	10

MANUFACTURERS' OR CONTRACTORS' DATA:

Newark Controls Company, NObsr-64817.

TUBE COMPLEMENT:

1 3A4, 1 6AL5, 2 12AX7.

REFERENCE DATA AND LITERATURE:

SC Form 567, BuShips Catalog.

SHIPPING DATA:

No. of Boxes	Contents & Identification	Volume (Cu. Ft.)	Overall Dimensions (inches)			Weight Packed (Lbs.)
			H	W	D	
	Test-Tool Set AN/USM-3B					

TEST-TOOL SET AN/USM-3B

EQUIPMENT SUPPLIED: (Continued)

Quant. Per Eq'pt	Name and Nomenclature	Case Mat'l	Stock Numbers (USAF) (Navy) (Army)	Overall Dimensions (inches)			Weight (Lbs.)
				H	W	D	
1	Telephone Receiver NT-491898						
1	Head Band NT-491901						
1	Power Cable Assembly NT-62472						
2	Electrical Lead, Red, NT-491899						
2	Electrical Lead, Black, NT-491899-A						
4	Adapter Connector, NT-491897						
12	Electrical Lead NT-491895						
1	Extension Rod 0-904						
1	Cord and Test Lead Holder H-918						
1	Battery and Bulb Case A-901						
1	Accessory Case A-902						
1	Technician's Handbook, N-901						
1	Tube Data Index N-101						
3	Alligator Clips, E-902						
2	Spade Lugs E-903						

EQUIPMENT SUPPLIED: (Continued)

Quant. Per Eq'pt	Name and Nomenclature	Case Mat'l	Stock Numbers (USAF) (Navy) (Army)	Overall Dimensions (inches)			Weight (Lbs.)
				H	W	D	
1	Screwdriver (4-inch), H-901						
1	Screwdriver (2-inch), H-902						
1	Combination Screwdriver H-903						

TEST-TOOL SET AN/USM-3B

EQUIPMENT SUPPLIED: (Continued)

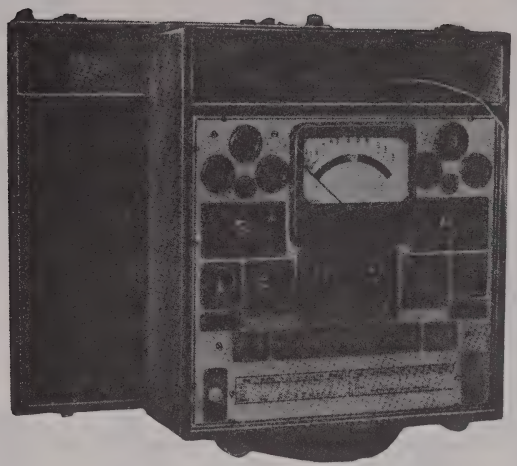
Quant. Per Eq'pt	Name and Nomenclature	Case Mat'l	Stock Numbers (USAF) (Navy) (Army)	Overall Dimensions (inches)			Weight (Lbs.)
				H	W	D	
1	Test-Tool Set AN/USM-3B Including:	metal					23
1	Case CY-703A/U			7	9-7/8	10-1/2	5
1	Tool Holder CY-704/U			3/4	9-1/4	9-1/4	
1	Tube Tester TV-4A/U			5-1/2	8-1/4	5-1/2	9
1	Signal Tracer TS-673A/U			3-1/2	3	5-3/4	2
1	Interference Generator SG-23/U			5-3/4 x 3/4 dia.			
1	Multimeter Test Prod ID-604/U			5-1/2	1-3/4	1-9/64	
1	Decade Resistor TS-672A/U			3/4	4-3/4	4-3/8	
1	Decade Capacitor TS-671/U			1-1/4	4-3/8	4-3/4	
1	Test Prod MX-933/U						
1	Test Prod MX-934/U						
1	RF Cable Assembly CG-570/U			36 long			
1	Box Head Wrench Set H-904, H-905, H-906, H-907, H-908, H-909						
1	Socket Wrench Set, H-910						

TEST-TOOL SET AN/USM-3B

EQUIPMENT SUPPLIED: (Continued)

Quant. Per Eq'pt	Name and Nomenclature	Case Mat'l	Stock Numbers (USAF) (Navy) (Army)	Overall Dimensions (inches)			Weight (Lbs.)
				H	W	D	
1	Socket Wrench Handle, H-911						
1	Long Nose Pliers, H-912						
1	Side Cutting Pliers, H-913						
1	Fuse Puller H-914						
1	Insulated Tweezers, H-915						
1	Pilot Light Extractor, H-916						
1	Alignment Tool H-917						
1	Soldering Iron Handle, H-919						
1	Soldering Iron Tip (small chisel), H-920						
1	Soldering Iron Tip (small round), H-921						
1	Soldering Iron Tip Holder H-922						
1	Neon Test Light I-901						
1	Flashlight 0-901						
1	Flashlight Extension 0-902						
1	Mirror, 0-903						
2	Instruction Book NavShips 91146						

TEST SET I-157-A



FUNCTIONAL DESCRIPTION:

A portable, general purpose unit used to test vacuum tubes; dry cell batteries; pilot lights; and mica, paper, and electrolytic capacitors. The unit is also used to obtain rapid measurements of voltage, current, resistance, and DC leakage. Test results are indicated by means of a meter and lamps located on the front panel.

RELATIONSHIP TO OTHER EQUIPMENT:

The I-157-A differs from the I-157 in decibel and resistance ranges and in meter-face markings. (The I-57 decibel range is -12 to +16 decibels, the resistance range is 0.5 to 10 megohms, and the meter face is divided into BAD, WEAK, and GOOD indications.) The I-157 is the military nomenclature for Precision Apparatus 920. The I-157-A is part of the IE-47A.

ELECTROMECHANICAL DESCRIPTION:

Circuit Information: The test set consists basically of a multimeter in conjunction with an electron tube tester. The tube tester is of the mutual conductance type.

(Continued)

	AIR FORCE	NAVY	ARMY
TYPE CLASS.			Standard
STOCK NOS.			NO-3F4157
PROCUREM'T INFO.:			
PROCUREM'T COG.: Army		DESIGN COG.: Army	
F.I.I.N.: 6625-153-4024		FUNCTIONAL CLASS. NO.: 10.1	
- Electronics Test Equipment -			I-157-A

TEST SET I-157-A

ELECTROMECHANICAL DESCRIPTION: (Continued)
Power Supply: 110 to 125 volts, AC, 50 to 60 cycles per second.
Meter Ranges:
Volts: 0 to 3000 volts AC and DC.
Ohms: 0 to 10 megohms.
Direct Current: 0 to 12 amps.
Decibels: -10 to +64 decibels.
Alternating Voltage Output: 0 to 3000 volts.

MANUFACTURERS' OR CONTRACTORS' DATA:
Precision Apparatus Company, Inc., 70-31 84th Street, Glendale 27, Long Island, New York.

TUBE COMPLEMENT:

REFERENCE DATA AND LITERATURE:
I-157-A: Dept. of Army TM 11-1209.

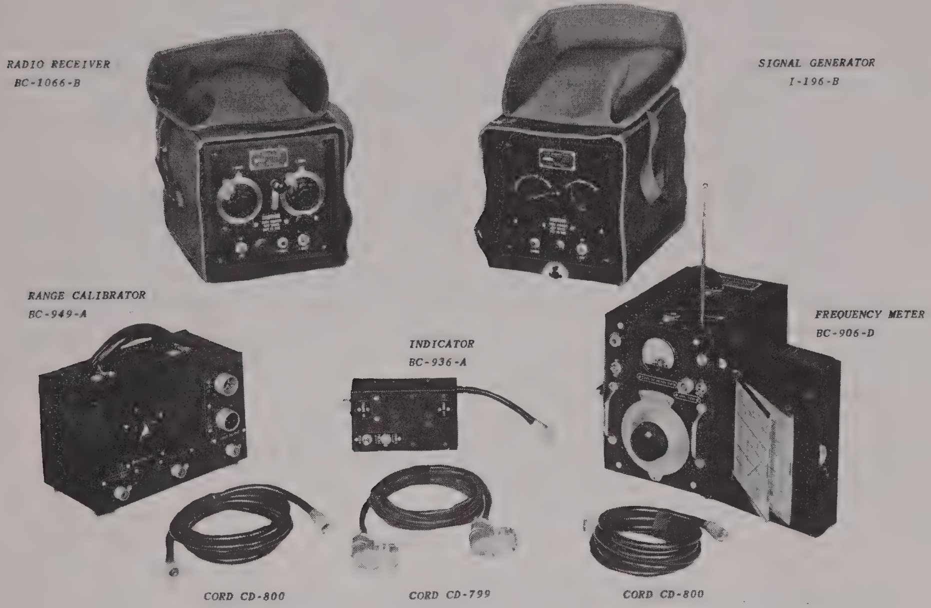
EQUIPMENT SUPPLIED:

Quant. Per Eq'pt	Name and Nomenclature	Case Mat'l	Stock Numbers (USAF) (Navy) (Army)	Overall Dimensions (inches)			Weight (Lbs.)
				H	W	D	
1	Test Set I-157-A	wood	NO-3F4157(USA)	13-3/4	12-3/4	6	15

SHIPPING DATA:

No. of Boxes	Contents & Identification	Volume (Cu. Ft.)	Overall Dimensions (inches)			Weight Packed (Lbs.)
			H	W	D	
1	Test Set I-157-A	1.25				36.9

TEST EQUIPMENT IE-56-A


RADIO RECEIVER
BC-1066-B
SIGNAL GENERATOR
I-196-B
RANGE CALIBRATOR
BC-949-A
INDICATOR
BC-936-A
FREQUENCY METER
BC-906-D
CORD CD-800
CORD CD-799
CORD CD-800

FUNCTIONAL DESCRIPTION:

A special purpose beacon test equipment consisting of a range calibrator, indicator, signal generator, frequency meter, and receiver. This equipment is portable by components only. There is no combination case. It is used to adjust homing beacons and interrogator-responsors, for frequency checks, range calibration, receiver alignment, transmitter output, and overall system performing checks. It is used for field and depot maintenance. Indication is provided by calibrated frequency and distance controls (megacycles per seconds and miles, respectively) and by a frequency dial (megacycles per second). The oscilloscope presentation provides visual indication.

RELATIONSHIP TO OTHER EQUIPMENT:

ELECTROMECHANICAL DESCRIPTION:

Circuit Information: The Frequency Meter BC-906-D calibrates the Signal Generator I-196-B and the set to be tested. The resulting output of the set to be tested is

(Continued)

	AIR FORCE	NAVY	ARMY
TYPE CLASS.	Limited Standard		
STOCK NOS.	1690-327206000	ASO-R16-T-1827	3F3933-56A
PROCUREM'T INFO.:	Army Spec. (Sig. C.) 371-1789		
PROCUREM'T COG.:	USAF	DESIGN COG.:	USAF, C&N
F.I.I.N.:		FUNCTIONAL CLASS. NO.:	10. 1
	- Electronics Test Equipment -		IE-56-A

This project was supported by the USAF on Contract AF 33(600)28276 and monitored by WADC, ARDC - Carl L. Frederick, Bethesda, Md. - Multilithed in U. S. A.

ELECTROMECHANICAL DESCRIPTION: (Continued)

received by Radio Receiver BC-1066-B from which it is fed to the Indicator BC-936-A. At the same time Range Calibrator BC-949-A calibrates the sweep speed of the indicator of the set under test. Indicator BC-936-A takes its input and changes it to a form suitable for the indicator of the set under test. A wave appears on the indicator of the set under test, which indicates variation of output, pulse width, signal duration, and range.

Power Supply: 135 volts supplied by three Battery, BA-53 (45 volts) and 1.5 volts supplied by one Battery, BA-35 (1.5 volts) for I-196-B. 45 volts supplied by one Battery, BA-53 (45 volts) and 1.5 volts supplied by one Battery BA-35 (1.5 volts) for BC-906-D. 1.5 volts supplied by two Battery, BA-30 (1.5 volts) for BC-936-A. 135 volts supplied by three Battery, BA-53(45 volts) and 1.5 volts supplied by one Battery, BA-35 (1.5 volts) for BC-1066-B. Power taken from equipment under test for BC-949-A.

Frequency Range: 150 to 235 megacycles per second.

Type of Transmission: Pulse Modulated, Continuous Wave.

Pulse Duration: 12 microseconds, 60 microseconds, 120 microseconds.

Distance Range: 10 miles, 50 miles, 100 miles.

Accuracy: ±0.25% of indicated frequency.

Atmospheric Limits: Dependent on battery operation.

MANUFACTURERS' OR CONTRACTORS' DATA:

Philco Manufacturing Company, 22nd Street and Lehi Avenue, Philadelphia 32, Pennsylvania; Order No. 5759-WF-43, May 1943; Project No. 743-203D; Approximate Cost per Unit, $210.00.

TUBE COMPLEMENT:

4 JAN-957, 1 JAN-6SL7/GT, 1 JAN-6H6/GT, 1 JAN-1D8/GT, 1 JAN-1S5.

REFERENCE DATA AND LITERATURE:

TO 16-40BC906-2 (Handbook of Operating Instructions).
TO 16-40BC936-2 (Handbook of Operating Instructions).
TO 16-40BC949-2 (Handbook of Operating Instructions).
TO 16-40BC1066-2 (Handbook of Operating Instructions).
TO 16-40I196-2 (Handbook of Operating Instructions).

SHIPPING DATA:

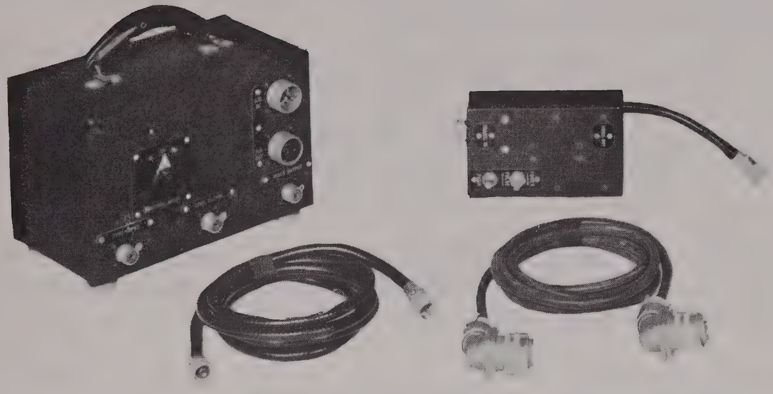
No. of Boxes	Contents & Identification	Volume (Cu. Ft.)	Over-all Dimensions (inches)			Weight Packed (Lbs.)
			H	W	D	

TEST EQUIPMENT IE-56-A

EQUIPMENT SUPPLIED:

Quant. Per Eq'pt	Name and Nomenclature	Case Mat'l	Stock Numbers (USAF) (Navy) (Army)	Over-all Dimensions (inches)			Weight (Lbs.)
				H	W	D	
1	Test Equipment IE-56-A Including:		1690-327206000 R16-T-1827 3F3933-56A				60.3
1	Frequency Meter BC-906-D Battery operated	Metal	7CAC-318208-55 2C1546D	9-1/4	6-3/4	12-3/8	17.8
1	Radio Receiver BC-1066-B	Wood	7CAC-681058 2C5066B	13-1/2	8	8	17.5
1	Signal Generator I-196-B Battery operated	Wood	7CAC-363954 3F3900-196B	12-1/2	8-1/4	8-1/4	16
1	Range Calibrator BC-949-A	Metal	7CAC-170276-1656 R16-AYS-BC-949-A 3F2440-949A	8-1/2	6-1/2	9-1/2	8
1	Indicator BC-936-A	Metal	7CAC-526235 R16-AYS-BC-936-A 2C1550-936A	1-7/8	3-1/2	6	1
2	Cord, CD-800 terminated on each end with Plug PL-259-A		8850-460433 1F430-107.48	48 long			
1	Cord, CD-799 terminated on one end in Plug 3108-18-3P and on the other end in Plug 3108-18-3S		7CAC-170264-37 R16-AYS-CD-799 3E1799-48	48 long			
						Total:	60.3

TEST EQUIPMENT IE-56-B



FUNCTIONAL DESCRIPTION:

A special purpose beacon test equipment consisting of a range calibrator and an indicator. This equipment is portable by components only. There is no combination case. It is used to test homing beacons and interrogator-responsors for range calibration and system performance checks. It is used for field and depot maintenance. Indication is by calibrated range dial (miles) and cathode ray tube display on the set being tested.

RELATIONSHIP TO OTHER EQUIPMENT:

Used to test prime equipments such as SCR-720-A and AN/APN-2. Same as Test Equipment IE-56-A except for deletion of frequency meter, radio receiver, and signal generator in the IE-56-B.

ELECTROMECHANICAL DESCRIPTION:

Circuit Information: Indicator BC-936-A detects the signal applied to it from the set

(Continued)

	AIR FORCE	NAVY	ARMY
TYPE CLASS.	Limited Standard		
STOCK NOS.	1690-327172050	ASO-R16-T-1828-5	3F3933-56B
PROCUREM'T INFO.:	Army Spec. No. 271-1789		
PROCUREM'T COG.:	USAF	DESIGN COG.:	USAF, C&N
F.I.I.N.:		FUNCTIONAL CLASS. NO.:	10.1
	- Electronics Test Equipment -		IE-56-B

This project was supported by the USAF on Contract AF 33(600)28276 and monitored by WADC, ARDC - Carl L. Frederick, Bethesda, Md. - Multilithed in U. S. A.

TEST EQUIPMENT IE-56-B

ELECTROMECHANICAL DESCRIPTION: (Continued)

under test and applies its own output to the oscilloscope of the indicator of the set under test.

Range Calibrator BC-949-A calibrates the sweep speeds of the radio set's indicator so that range calibration tests can be made. This range calibrator contains a resonating circuit that can be switched to produce signals of different duration, corresponding to the desired ranges.

Power Supply: 1.5 volts supplied by two Battery, BA-30 (1.5 volts) for BC-936-A. Power taken from equipment under test for BC-949-A.

Frequency Range: 150 to 235 megacycles per second.

Type of Transmission: Pulse Modulated, Continuous Wave.

Distance Range: 10 miles, 50 miles, 100 miles.

Input Impedance: 50 ohms to high impedance video.

MANUFACTURERS' OR CONTRACTORS' DATA:

Philco Manufacturing Company, 22nd Street and Lehi Avenue, Philadelphia 32, Pennsylvania; USAF Order No. 2261-DAY-45AR.

TUBE COMPLEMENT:

1 JAN-957, 1 JAN-6SL7/GT, 1 JAN-6H6/GT.

REFERENCE DATA AND LITERATURE:

CO-AN-08-10EB-1 (Instruction Book).
TO 16-40BC936-2 (Instruction Book).
TO 16-40BC949-2 (Instruction Book).

SHIPPING DATA:

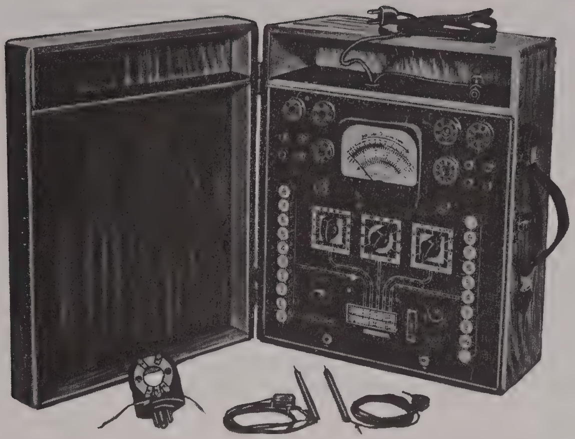
No. of Boxes	Contents & Identification	Volume (Cu. Ft.)	Over-all Dimensions (inches)			Weight Packed (Lbs.)
			H	W	D	
IE-56-B	- Electronics Test Equipment -					

TEST EQUIPMENT IE-56-B

EQUIPMENT SUPPLIED:

Quant. Per Eq'pt	Name and Nomenclature	Case Mat'l	Stock Numbers (USAF) (Navy) (Army)	Over-all Dimensions (inches)			Weight (Lbs.)
				H	W	D	
1	Test Equipment IE-56-B Including:		1690-327172050 R16-T-1828-5 3F3933-56B				10
1	Indicator BC-936-A	Metal	7CAC-526235 R16-AYS-BC-936-A 2C1550-936A	1-7/8	3-1/2	6	2
1	Range Calibrator BC-949-A	Metal	7CAC-170276-1656 R16-AYS-BC-949-A 3F2440-949A	8-1/2	6-1/2	9-1/2	8
2	Cord CD-800/U		8850-460433 1F430-107.48	48 long			
1	Cord CD-799		7CAC-170264-37 R16-AYS-CD-799 3E1799-48	48 long			
1	Cable Assembly CG-107/U		R16-AN-CG-107/U				
1	Adapter AN-3057-10		R17-A-2299				
1	Instruction Book						

TEST SET TS-313/U



FUNCTIONAL DESCRIPTION:

A portable, general purpose emission type tube checker and multimeter used to make measurements of audio frequency output, AC and DC voltages, direct current, resistance, and capacitance. The unit can also be used as a free-point tester to make voltage and current measurements at tube socket terminals while the power supply to the equipment under test is turned on. The tester provides sockets for 4-, 5-, and 6-prong, combination large and small 7-prong, 8-prong octal, 8-prong loctal, 5-prong Bantam, Jr., and 7-prong miniature and midget tubes. A special adapter for testing acorn tubes, and a lead for testing tubes with top caps are provided. Pilot lamps can be tested in a special socket located in the center of the 7-prong socket. Test results are shown on a special multimeter.

RELATIONSHIP TO OTHER EQUIPMENT:

The TS-313/U is similar to the Vacuum Tube Tester Supreme 504-A.

	AIR FORCE	NAVY	ARMY
TYPE CLASS.			
STOCK NOS.			
PROCUREM'T INFO.:			
PROCUREM'T COG.: Navy		DESIGN COG.:	Navy
F.I.I.N.:		FUNCTIONAL CLASS. NO.:	10.1
	- Electronics Test Equipment -		TS-313/U

TEST SET TS-313/U

ELECTROMECHANICAL DESCRIPTION:

Circuit Information: The circuitry of this tester consists of three basic sections: a tube testing circuit, a battery testing circuit, and a set tester or multimeter circuit. The tube testing circuit operates on the emission principle, checking the cathode or filament, as the case may be, for its ability to emit electrons or current to other elements of the tube. The battery test circuit provides a drain comparable to a normal load for the type of battery under test. Discard or reject points are indicated on a chart supplied by the battery manufacturer. The set tester or multimeter section, incorporates seven functions, using one meter, tip jacks, and test leads.

Power Supply: 110 to 133 volts, AC, 60 cycles per second, single-phase; 1.5-volt Battery BA-15-A.

Ranges:
- 0 to 5, 10, 50, 250, 1000 volts AC.
- 0 to 5, 25, 100, 250, 500, 1000, 2500 volts DC.
- 0 to 0.5, 2.5, 10, 50, 250 milliamps DC.
- 0 to 0.25, 1.0, 10 amps DC.
- 0 to 5, 10, 15, 50, 250, 1000 volts, AF output.
- 0 to 20, 200, 2000, 200,000 ohms.
- 0 to 20 megohms.

Sensitivity: 1000 ohms per volt.

Capacitance: 2 to 50 microfarads.

Capacitor Leakage Test Ranges:
- Electrostatic capacitors: 500 volts and over.
- Electrolytic capacitors: 2 to 50 microfarads; 25 to 450 working volts.

MANUFACTURERS' OR CONTRACTORS' DATA:

Supreme, Inc., Greenwood, Mississippi.

TUBE COMPLEMENT:

1 71-A.

REFERENCE DATA AND LITERATURE:

BuOrd OP 1883.

SHIPPING DATA:

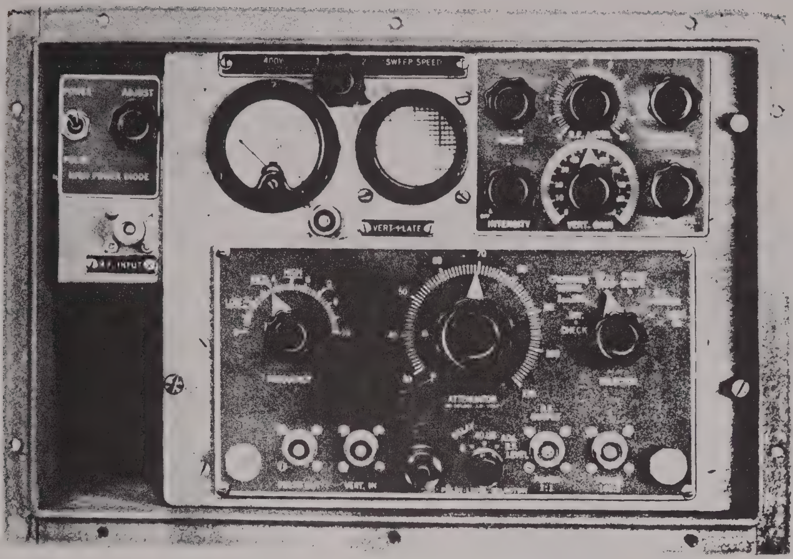
No. of Boxes	Contents & Identification	Volume (Cu. Ft.)	Overall Dimensions (inches)			Weight Packed (Lbs.)
			H	W	D	
	Test Set TS-313/U					

TEST SET TS-313/U

EQUIPMENT SUPPLIED:

Quant. Per Eq'pt	Name and Nomenclature	Case Mat'l	Stock Numbers (USAF) (Navy) (Army)	Overall Dimensions (inches)			Weight (Lbs.)
				H	W	D	
1	Test Set TS-313/U	wood					
2	Test Lead Assembly						
1	Adapter (For Acorn Tubes)						

TEST SET TS-355/UP



FUNCTIONAL DESCRIPTION:

A portable, special purpose instrument designed to measure receiver sensitivity and transmitter power output of MK3 IFF systems.

RELATIONSHIP TO OTHER EQUIPMENT:

The TS-355/UP is similar to the TS-182/UP except that the former has a decreased repetition rate, two sweep speeds, increased delay, a larger sync output pulse, an added high-speed diode section, and an added circuit to permit the RF level meter to be used as a 400-volt voltmeter.

ELECTROMECHANICAL DESCRIPTION:

Circuit Information: The test set consists essentially of a signal generator, power output indicating circuits and a synchroscope. Waveform and pulse shapes are displayed on a 2-inch cathode-ray tube. Power measurements are accomplished by calibrating the vertical deflection of the oscilloscope or by using the RF

(Continued)

	AIR FORCE	NAVY	ARMY
TYPE CLASS.		Substitute Standard	
STOCK NOS.	3F4325-355	(ASO)R16AN-TS355UP	
PROCUREM'T INFO.:			
PROCUREM'T COG.: Navy		DESIGN COG.: Navy, BuShips	
F.I.I.N.:		FUNCTIONAL CLASS. NO.: 10.1	

ELECTROMECHANICAL DESCRIPTION: (Continued)

voltmeter. The power, in watts, is determined by using a chart with power plotted against vertical deflection divisions or by calculating the power from the voltmeter reading. The test set provides a variable frequency output with indications on the dial at 158, 172, 186 and 212 megacycles per second. The output attenuator reads directly in decibels below 1 volt.

Power Supply: 115 volts ±5%, AC, 50 to 1600 cycles per second, 75 to 85 watts.

RF Signal Generator:

Frequency Range: 150 to 240 megacycles per second, continuous.

Output Voltage: 30 to 110 decibels below 1.0 volt rms (31.62 millivolts to 3 microvolts).

Type of Transmission: Pulses, fixed duration between 4.0 and 8.0 microseconds.

Pulse Repetition Rate: 150 pulses per second, +10% or -30%.

Power Range: 0 to 3000 watts ±25%.

Oscilloscope:

Sweep Speed: 20 or 100 microseconds per inch.

Vertical Amplifier Gain: 40.

Vertical Amplifier Response: 50 cycles per second to 500 kilocycles per second.

Trigger Pulse:

Polarity: Positive.

Width: 4.0 to 8.0 microseconds.

Amplitude: 200 volts peak into 75 ohm load.

Pulse Delay: 0 or 40 microseconds (with respect to trigger pulse).

Sensitivity Measurements:

Range: 30 to 110 decibels below 1.0 volt.

Accuracy: ±2.0 decibels.

MANUFACTURERS' OR CONTRACTORS' DATA:

Harvey-Wells Electronics, Incorporated, North Street, Southbridge, Massachusetts; Contract No. NOas 7871.

TUBE COMPLEMENT:

1 6SN7-GT, 1 5R4-GY, 1 6X5-GT, 1 2AP1, 2 955, 1 6SL7, 1 6AG7, 1 6AL5.

REFERENCE DATA AND LITERATURE:

NavAer 16-55-507, Handbook of Maintenance Instructions.

SHIPPING DATA:

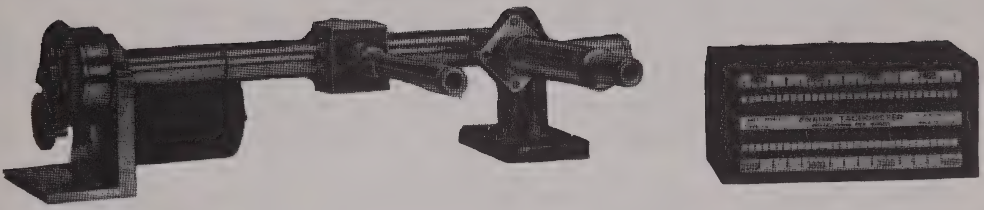
No. of Boxes	Contents & Identification	Volume (Cu. Ft.)	Overall Dimensions (inches)			Weight Packed (Lbs.)
			H	W	D	
1	Test Set TS-355A/UP	3.43	15	18	22	95

TEST SET TS-355/UP

EQUIPMENT SUPPLIED:

Quant. Per Eq'pt	Name and Nomenclature	Case Mat'l	Stock Numbers (USAF) (Navy) (Army)	Overall Dimensions (inches)			Weight (Lbs.)
				H	W	D	
1	Test Set, TS-355/UP		F16-T-20137-6701	16	9-1/4	12	43
1	Tuning Unit TN-79/UP		F16-T-98375-1001	9-3/4	5-1/4	5	5-3/4
1	Test Cable			48 long			
2	Adapter UG-197/U		N17-T-67727-5486	13/16	1-1/8	5/8	
1	AC Line Cord CX 337A/U			180 long			
1	100 to 1 Power Adapter CN-46/U		N16-A-96079-3256	4	1-1/4	1-1/4	
1	High Power Diode Unit			6-1/4	4	3	
1	1 to 5 Pad CN-117/U		N16-A-96891-1501	4-7/8	1-1/4	1-1/4	
1	Transit Case CY-278/UP	metal	N16-C-10623-2201	16	17	11	
1	Connecting Cable			48 long			

TEST SET TS-364/APX-15
(TEST SET, RADAR, TS-364/APX-15)



FUNCTIONAL DESCRIPTION:

A special test set used in conjunction with a test signal generator when checking the operation of a propeller-modulated identification system. Essentially, it provides a means of amplitude-modulating the radio frequency output of the associated signal generator, which output is used as a reference signal for checking the AN/APX-15 system.

All indications appear on the radar system itself. A vibrating reed-tachometer covering 1725 to 2475 rpm is supplied for checking the motor speed.

Another frequency meter of similar design covering 49 to 51 cycles per second is also supplied for checking the output of the audio oscillator.

RELATIONSHIP TO OTHER EQUIPMENT:

This unit is used with the TS-348/AP Signal Generator when checking the AN/APX-15 Radar System.

	AIR FORCE	NAVY	ARMY
TYPE CLASS.	Limited Standard		
STOCK NOS.	7CAC-801319-2156		3F4325-364
PROCUREM'T INFO.: USAF Spec. No. C-7098			
PROCUREM'T COG.:	USAF	DESIGN COG.:	USAF, C&N
F.I.I.N.:		FUNCTIONAL CLASS. NO.:	10.1
	- Electronics Test Equipment -		TS-364/APX-15

This project was supported by the USAF on Contract AF 33(600)28276 and monitored by WADC, ARDC - Carl L. Frederick, Bethesda, Md. - Multilithed in U. S. A.

TEST SET TS-364/APX-15
(TEST SET, RADAR, TS-364/APX-15)

ELECTROMECHANICAL DESCRIPTION:

Power Supply: 28 volts direct current to driving motor only.

Frequency Range: 2470 to 2660 megacycles per second. 49 to 51 cycles per second, 1725 to 2475 rpm.

Signal Input: Output of TS-348/AP.

Imput Impedance: Type "N" connector (through a 10 decibel pad).

Percentage Amplitude Modulation: 17% on the fundamental and 20% on the second harmonic over the above frequency range (fixed).

Modulation Frequency: 0 to 70 cycles per second (variable).

Signal Output: 30 decibels less than the input signal. (A 10-decibel pad is provided in the input circuit, which prevents variation in this test set from affecting the output of the signal generator).

Output Impedance: 7/8 inch coaxial fitting to a type "N" adapter connector.

MANUFACTURERS' OR CONTRACTORS' DATA:

L. J. Wing Manufacturing Company, 154 West 14th Street, New York 11, New York; Order No. 2139-DAY-45-RA.

TUBE COMPLEMENT:

None.

REFERENCE DATA AND LITERATURE:

M-202 (Preliminary Instruction Manual).

SHIPPING DATA:

No. of Boxes	Contents & Identification	Volume (Cu. Ft.)	Over-all Dimensions (inches)			Weight Packed (Lbs.)
			H	W	D	
1	Test Set, TS-364/APX-15 with accessories (Export Packed)	2.50	10	28	15	50.00

TEST SET TS-364/APX-15
(TEST SET, RADAR, TS-364/APX-15)

EQUIPMENT SUPPLIED:

Quant. Per Eq'pt	Name and Nomenclature	Case Mat'l	Stock Numbers (USAF) (Navy) (Army)	Over-all Dimensions (inches)			Weight (Lbs.)
				H	W	D	
1	Test Set TS-364/APX-15		7CAC-801319-2156 3F4325-364				20.00
1	Transit Case	Aluminum		6-1/2	22-1/2	11-1/2	
1	Frequency Meter TS-494/U			3-1/2			1.00
1	Tachometer TS-493/U			3-1/2	5-5/8	1-1/2	1.45
1	Attenuator CN-42/UP		7CAC-075605 2Z396-42	5 long			
1	Cord CX-937/U		3F4325-937	240 long			
1	Cord CX-938/U			36 long			
1	Cord CX-92/U		7CAC-170265-437 1F430-92.60	60 long			
						Total:	29.00

FREQUENCY-POWER METER AN/SPM-4

FREQ.-POWER METER
AN/SPM-4

FUNCTIONAL DESCRIPTION:

A portable, self-contained, general purpose equipment used to make frequency and power checks on radar systems. Test results are indicated on a calibrated dial and on a temperature-compensated wattmeter located on the front panel.

RELATIONSHIP TO OTHER EQUIPMENT:

Equipment required for operation of the unit, but not supplied, includes three dry cell batteries (BA-30) for normal operating temperature, and three dry cell batteries (JAN 2030/U) for operating temperature below -20°C.

ELECTROMECHANICAL DESCRIPTION:

Circuit Information: The unit consists essentially of a frequency meter, a wattmeter, a thermistor mount and resistor assembly, and associated microwave assemblies for the frequency meter and wattmeter. RF energy from the radar under test is coupled via a coaxial cable through a built-in waveguide adapter

(Continued)

	AIR FORCE	NAVY	ARMY
TYPE CLASS.			
STOCK NOS.			
PROCUREM'T INFO.:			
PROCUREM'T COG.: Navy		DESIGN COG.: Navy	
F.I.I.N.:		FUNCTIONAL CLASS. NO.: 10.1.1	
	- Electronics Test Equipment -		AN/SPM-4

FREQUENCY-POWER METER AN/SPM-4

ELECTROMECHANICAL DESCRIPTION: (Continued)

to the waveguide of the frequency power meter. The energy travels down the waveguide to the thermistor mount and resistor assembly (which is part of a balanced bridge circuit) and is absorbed by the thermistor. This unbalances the bridge circuit, causing the wattmeter to give an indication. The energy incident upon the thermistor is controlled by a calibrated variable attenuator which is adjusted to give a 1 milliwatt reading on the meter. The attenuator indicates the average power level of the input signal in decibels above 1 milliwatt. The actual power of the radar is determined by adding the attenuation of the connecting apparatus between the radar and the meter to the attenuator reading, and then converting this value into power.

Power Supply: Three 4.5-volt Batteries BA-30 or three dry cell Batteries JAN 2030/U.

Frequency Range: 5.4 to 5.9 kilomegacycles per second.

Frequency Measurement Characteristics:

Accuracy at 25°C: ±1 megacycle per second.
Accuracy from -40°C to +55°C: ±4 megacycles per second.
Accuracy with Correction Curves: ±2.5 megacycles per second.

Power Measurement Characteristics:

Range: +1 to +30 decibels referred to 1 milliwatt at input connector.
Accuracy: ±1.5 decibel.
Accuracy with Correction Charts: ±1.0 decibel.
Operating Temperature: -20° to +55°C.

MANUFACTURERS' OR CONTRACTORS' DATA:

Sperry Gyroscope Company, Division of Sperry Rand Corporation, Great Neck, Long Island, New York.

TUBE COMPLEMENT:

REFERENCE DATA AND LITERATURE:

SHIPPING DATA:

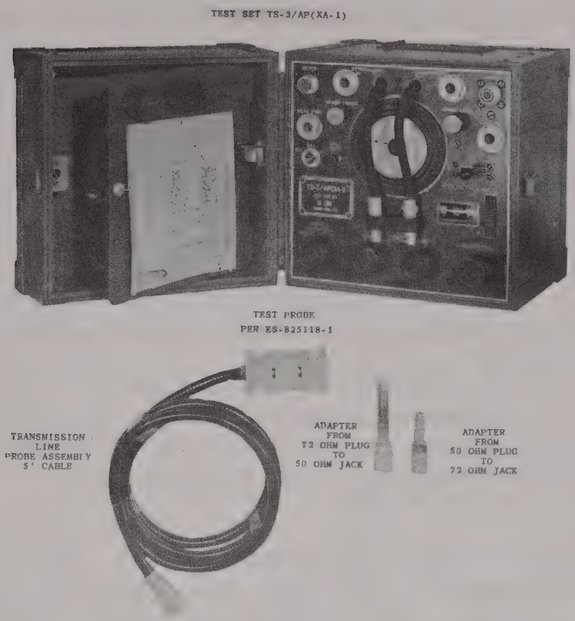
No. of Boxes	Contents & Identification	Volume (Cu. Ft.)	Overall Dimensions (inches)			Weight Packed (Lbs.)
			H	W	D	
	Frequency-Power Meter AN/SPM-4					

FREQUENCY-POWER METER AN/SPM-4

EQUIPMENT SUPPLIED:

Quant. Per Eq'pt	Name and Nomenclature	Case Mat'l	Stock Numbers (USAF) (Navy) (Army)	Overall Dimensions (inches)			Weight (Lbs.)
				H	W	D	
1	Frequency-Power Meter AN/SPM-4	metal		10-7/8	12	16	20
1	Calibrated Coaxial Cable Assembly			8' long			
1	Waveguide Adapter						
1	Handbook of Instructions						

TEST SET TS-3/AP
(TEST SET, RADAR, TS-3/AP)


TEST SET TS-3/AP(XA-1)
TEST PROBE PER ES-825118-1
TRANSMISSION LINE PROBE ASSEMBLY 5' CABLE
ADAPTER FROM 72 OHM PLUG TO 50 OHM JACK
ADAPTER FROM 50 OHM PLUG TO 72 OHM JACK

FUNCTIONAL DESCRIPTION:

A general purpose, portable and self-contained instrument used to measure the power and frequency of radar transmitters, beating oscillators of radar receivers and test signal generators. May also be used to measure converter crystal current of certain radar systems and when used with an external signal generator and a separate intermediate frequency amplifier, to measure the sensitivity of radar receivers.

Power is measured by referring values of direct current through the thermistor, neasured with and without radio frequency energy applied, to the power computer chart.

The resonant cavity is tuned by a micrometer-type plunger and resonance is indicated by maximum meter deflections when frequency measurements are made using the power-measuring circuit. The resultant micrometer head reading is converted to frequency value by use of the calibration chart.

(Continued)

	AIR FORCE	NAVY	ARMY
TYPE CLASS.	Limited Standard		
STOCK NOS.	7CAC-801319-227	R16-AN-TS-3/AP	3F4325-3
PROCUREM'T INFO.: USAF Spec. No. 71-1773			
PROCUREM'T COG.: USAF		DESIGN COG.: USAF, ARL	
F.I.I.N.:		FUNCTIONAL CLASS. NO.: 10. 1. 1	
- Electronics Test Equipment -			TS-3/AP

is project was supported by the USAF on Contract AF 33(600)28276 and monitored by WADC, ARDC - Carl L. Frederick, Bethesda, Md. - Multilithed in U.S.A.

TEST SET TS-3/AP
(TEST SET, RADAR, TS-3/AP)

RELATIONSHIP TO OTHER EQUIPMENT:

Part of AN/APM-10 and AN/CPM-7. TS-3/AP and TS-3A/AP are similar except that the frequency range of TS-3A/AP is greater.

ELECTROMECHANICAL DESCRIPTION:

Power Supply: 4.5 volts supplied by three Batteries, BA-30 (1.5 volts).
Type of Reception: Continuous Wave, Pulse.
Frequency Range, Input: 2700 to 3400 megacycles per second for frequency and power measurements.
Frequency Range, Output: An output jack is provided on the meter for connecting the rectified video signal to a test oscilloscope or meter.
Power Range, Input: 0.5 to 12.5 milliwatts. (The power range may be extended by inserting a 10 decibel pad and/or 13 decibel connecting cable, furnished with the unit into the measuring circuit.)
Impedance, Input: 50 ohms. (Adapters furnished for 50 to 72 ohm use.)
Accuracy: Frequency meter, ±0.5 megacycles per second (relative), ±3 megacycles per second (absolute). Power meter, ±1 decibel (nominal).
Meter Range: 0 to 2 milliamperes, 75 ohms resistance.
Temperature Range: -40° C. to +50° C.

MANUFACTURERS' OR CONTRACTORS' DATA:

Western Electric Company, New York, New York; Order No. 2116-DAY-45, 21 February 1945; Order No. 2144-45-RA, 30 June 1945; Order No. 2205-45-AR, 28 June 1945; Western Electric Specification No. X-61714B; Approximate Cost per Unit, $596.00.

TUBE COMPLEMENT:

1 JAN-1N21B (Crystal Rectifier).

REFERENCE DATA AND LITERATURE:

TO 16-35TS3-2 (Operation Instructions).
TO 16-35TS3-3 (Maintenance Instructions).
TO 16-55-21 (Spare Parts List).

SHIPPING DATA:

No. of Boxes	Contents & Identification	Volume (Cu. Ft.)	Over-all Dimensions (inches)			Weight Packed (Lbs.)
			H	W	D	
1	Test Set TS-3/AP (Domestic Packed)	6.6	11	9-1/2	9	25

TEST SET TS-3/AP
(TEST SET, RADAR, TS-3/AP)

EQUIPMENT SUPPLIED:

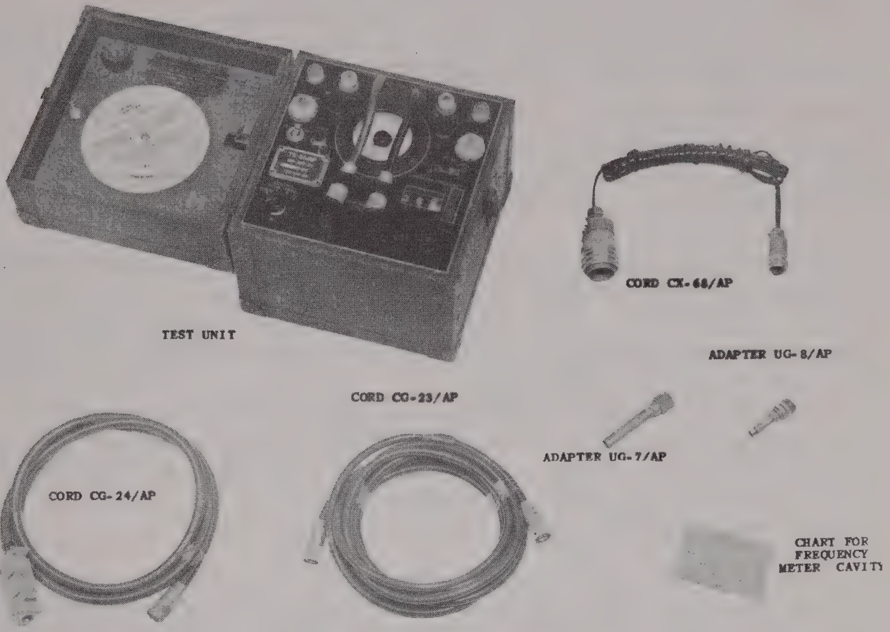
Quant. Per Eq'pt	Name and Nomenclature	Case Mat'l	Stock (USAF) Numbers (Navy) (Army)	Over-all Dimensions (inches)			Weight (Lbs.)
				H	W	D	
1	Test Set TS-3/AP		7CAC-801319-227 R16-AN-TS-3/AP 3F4325-3	9-1/2	8-3/4	11-1/4	16
1	Cord CG-23/AP		7CWX-BL405781 R16-AN-CG-23/AP 1F4325-21.156	156 long			
1	Cord CX-68/AP		7CAC-170264-435 R16-AN-CX-68/AP 3E6000-68-120	120 long			
1	Cord CG-24/AP		R16-AN-CG-24/AP 1F430-24	60 long			
1	Adapter UG-7/AP		8850-101487 2ZK308-7.1	2-1/2	3/4 dia.		
1	Adapter UG-8/AP		8850-101600 R16-A-406 2ZK308-8.1	2-3/32	5/8 dia.		
1	Case CY-45/AP		7CAC-196535 R16-C-15879-40 3F1774-2	10-1/2	10-1/2	14-1/2	
3	Power Computer Charts		7CWX-BR435074 3F4325-3/C1 or 3F4325-3A/2				
3	Crystal Units 1N21B		3300-234137020 2J1N21B	3	3	1	0.1
1	Neon Lamp RCA 991		3300-235705000 2J991	1.56	0.63		0.1
1	Hex Wrench No. 8		7900-859490 6R57400				
1	Cord CG-381/U		7CAC-170265-287 R16-AN-CG-381/U 1F430-381.60	60 long			

TEST SET TS-3/AP
(TEST SET, RADAR, TS-3/AP)

EQUIPMENT SUPPLIED:

Quant. Per Eq'pt	Name and Nomenclature	Case Mat'l	Stock Numbers (USAF) (Navy) (Army)	Over-all Dimensions (inches)			Weight (Lbs.)
				H	W	D	
1	Strap ST-19		7CBA-L73835 2Z9019				
						Total:	24

TEST SET TS-3A/AP
(TEST SET, RADAR, TS-3A/AP)



FUNCTIONAL DESCRIPTION:

A general purpose, portable and self-contained instrument used to measure the power and frequency of radar transmitters, beating oscillators of radar receivers and test signal generators. May also be used to measure converter crystal current of certain radar systems and when used with an external signal generator and a separate intermediate frequency amplifier, to measure the sensitivity of radar receivers.

Power is measured by referring values of direct current through the thermistor, measured with and without radio frequency energy applied, to the power computer chart.

The resonant cavity is tuned by a micrometer-type plunger and resonance is indicated by maximum meter deflections when frequency measurements are made using the power-measuring circuit. The resultant micrometer head reading is converted to frequency value by use of the calibration chart.

	AIR FORCE	NAVY	ARMY
TYPE CLASS.	Limited Standard		
STOCK NOS.	7CAC-801319-2258	R16-AN-TS-3A/AP	3F4325-3A
PROCUREM'T INFO.:			
PROCUREM'T COG.: USAF		DESIGN COG.: USAF, ARL	
F.I.I.N.:		FUNCTIONAL CLASS. NO.: 10.1.1	
- Electronics Test Equipment -			TS-3A/AP

is project was supported by the USAF on Contract AF 33(600)28276 and monitored by WADC, ARDC - Carl L. Frederick, Bethesda, Md. - Multilithed in U. S. A.

TEST SET TS-3A/AP
(TEST SET, RADAR, TS-3A/AP)

RELATIONSHIP TO OTHER EQUIPMENT:

Test Set TS-3A/AP has been replaced for Air Force use by a combination of Wavemeter TS-117/GP and Power Meter TS-125/AP. TS-3/AP and TS-3A/AP are similar except that TS-3A/AP has a wider frequency range.

ELECTROMECHANICAL DESCRIPTION:

Power Supply: 4.5 volts supplied by three Batteries, BA-30 (1.5 volts).
Type of Reception: Continuous Wave, Pulse.
Frequency Range, Input: 2400 to 3400 megacycles per second for frequency and power measurements.
Frequency Range, Output: An output jack is provided on the meter for connecting the rectifier video signal to a test oscilloscope or meter.
Signal Range, Input: 0.5 to 12.5 milliwatts. (The power range may be extended by inserting a 10 decibel pad and/or a 13 decibel connecting cable, furnished with the unit, into the measuring circuit.)
Impedance, Input: 50 ohms. (Adapters furnished for 50 to 72 ohm use.)
Accuracy: Frequency meter, ±0.5 megacycles per second (relative); ±3 megacycles per second (absolute). Power meter, ±0.75 decibel (nominal).
Meter Range: 0 to 2 milliamperes, 75 ohms resistance.
Temperature Range: -40° C. to +50° C.

MANUFACTURERS' OR CONTRACTORS' DATA:

Western Electric Company, New York, New York; Western Electric Specification No. X 61714 C; Order No. 89-DAY-DE-RA; Order No. 132-DAY-44, 17 November 1945, Approximate Cost per Equipment, $607.00; Order No. 2205-DAY-45, 28 June 1945, Approximate Cost per Equipment, $595.00; Order No. 2144-DAY-45, 30 June 1945, Approximate Cost per Equipment, $595.00.

TUBE COMPLEMENT:

1 JAN-1N21B (Crystal Rectifier).

REFERENCE DATA AND LITERATURE:

Manuscript of Instructions.
TO 16-35TS3-2 (Operating Instructions).
TO 16-35TS3-3 (Maintenance Instructions).
TO 16-55-21 (Spare Parts List).

SHIPPING DATA:

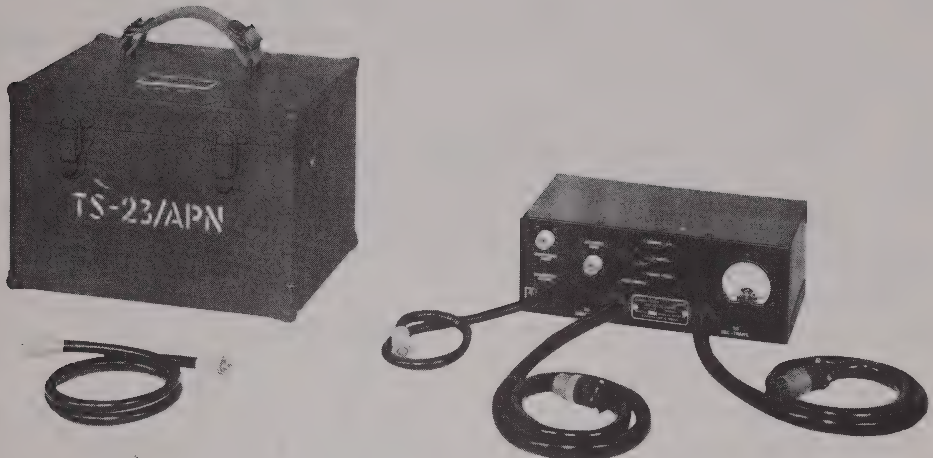
No. of Boxes	Contents & Identification	Volume (Cu. Ft.)	Over-all Dimensions (inches)			Weight Packed (Lbs.)
			H	W	D	
1	Test Set, TS-3A/AP with accessories (Domestic Packed)	4.45	16	20	24	60

TEST SET TS-3A/AP
(TEST SET, RADAR, TS-3A/AP)

EQUIPMENT SUPPLIED:

Quant. Per Eq'pt	Name and Nomenclature	Case Mat'l	Stock Numbers (USAF) (Navy) (Army)	Over-all Dimensions (inches)			Weight (Lbs.)
				H	W	D	
1	Test Set TS-3A/AP Including:		7CAC-801319-2258 R16-AN-TS-3A/AP 3F4325-3A	9-1/2	8-3/4	11-1/4	16
1	Cord CG-23/AP		7CWX-BL405781 R16-AN-CG-23/AP 1F4325-21. 156	156 long			
1	Cord CG-68/AP		7CAC-170264-435 R16-AN-CX-68/AP 3E6000-68-120	120 long			
1	Cord CG-24/AP		7CWX-8405735 R16-AN-CG-24/AP 1F4W1-82. 60	60 long			
1	Adapter UG-7/AP		8850-101487 2ZK308-7. 1	2-1/2	3/4 dia.		
1	Adapter UG-8/AP		8850-101600 R16-A-406 2ZK308-8. 1	2-3/32	5/8 dia.		
1	Case CY-45/AP		7CAC-176535 R16-C-15879-40 3F1774-2	10-1/2	10-1/2	14-1/2	
3	Power Computer Charts		7CWX-BR435074 3F4325-3A/2				
4	Crystals JAN-1N21B (3 Spares)		3300-234137020 2J1N21B				
1	Neon Lamp RCA 991		3300-235705000 2J991				
1	Hex Wrench No. 8		7900-859490 6R57400	5/64			
1	Cord CG-381/U		7CAC-170265-287 R16-AN-CG-381/U 1F430-381. 60	60 long			
1	Instruction Book						

TEST SET TS-23/APN
(TEST SET, RADAR, TS-23/APN)



FUNCTIONAL DESCRIPTION:

A portable and self-contained radio frequency wavemeter and wattmeter used to measure or check transmitter operating frequency, check relative power output, provide for observation of transmitter pulse wave shape and provide for low-voltage "B" plus measurements.

The transmitter frequency is set by tuning for a maximum deflection on the micro-ammeter located in the "fixed" tuned section of the wavemeter. Relative power output measurements are also indicated on the same meter at a calibrated marking of 375 volts. The other calibrated marking of 320 volts on this meter is for measuring low-voltage "B" plus in Radio Sets SCR-718.

RELATIONSHIP TO OTHER EQUIPMENT:

Test Set TS-23/APN was formerly called the IE-69.

	AIR FORCE	NAVY	ARMY
TYPE CLASS.	Limited Standard		
STOCK NOS.	7CAC-801319-217	R16-AN-TN-23-APN	3FK4325-23
PROCUREM'T INFO.:	USAF Spec. No. 371-1783		
PROCUREM'T COG.:	USAF	DESIGN COG.:	USAF, ARL
F.I.I.N.:		FUNCTIONAL CLASS. NO.:	10.1.1
	- Electronics Test Equipment -		TS-23/APN

This project was supported by the USAF on Contract AF 33(600)28276 and monitored by WADC, ARDC - Carl L. Frederick, Bethesda, Md. - Multilithed in U. S. A.

TEST SET TS-23/APN
(TEST SET, RADAR, TS-23/APN)

ELECTROMECHANICAL DESCRIPTION:

Power Supply: 200 watts; 115 volts, AC; 380 to 2600 cycles per second, obtained from altimeter under test.

Type of Reception: Pulse.

Frequency Range, Input: 440 megacycles per second (only).

Frequency Range, Output: Video. The video output is fed to the altimeter-indicator or a test oscilloscope.

Impedance, Input: 50 ohms.

Impedance, Output: 70 ohms (approximately).

Accuracy: Frequency, error does not exceed ±0.3 megacycles per second, ±0.1% (relative); Power, ±5% (relative).

Meter Scale: Basically 0 to 200 microamperes direct current. Calibrated from 0 to 600 volts direct current with scale markings at 320 volts and 375 volts.

Temperature Range: -20° C. to $+40^{\circ}$ C.

Relative Humidity Range: Up to 95%.

Barometric Pressure Range: 20 to 30 inches of mercury.

MANUFACTURERS' OR CONTRACTORS' DATA:

Electronic Corporation of America, New York, New York; Order No. 415-DAY-44, 28 October 1943, Approximate Cost per Equipment, $112.00; Order Nos. 901-DAY-44, 25 April 1944, Approximate Cost per Equipment, $135.00, 431-DAY-45-RA, 431-DAY-44, 15 September 1944, Approximate Cost per Equipment, $135.00.

TUBE COMPLEMENT:

1 JAN-9004.

REFERENCE DATA AND LITERATURE:

AN 16-35TS23-3 (Maintenance Instructions).
TO 16-55-44 (Spare Parts List).

SHIPPING DATA:

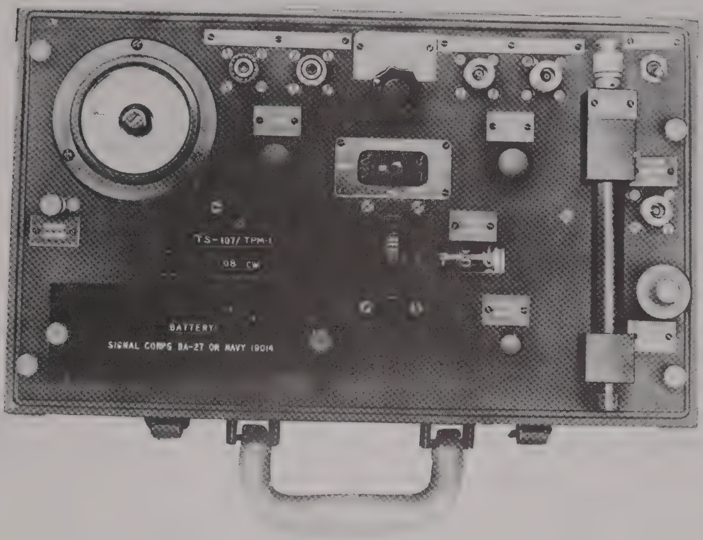
No. of Boxes	Contents & Identification	Volume (Cu. Ft.)	Over-all Dimensions (inches)			Weight Packed (Lbs.)
			H	W	D	
1	Test Set TS-23/APN (MFP)	2.7	14.5	14	21	30

TEST SET TS-23/APN
(TEST SET, RADAR, TS-23/APN)

EQUIPMENT SUPPLIED:

Quant. Per Eq'pt	Name and Nomenclature	Case Mat'l	Stock Numbers (USAF) (Navy) (Army)	Over-all Dimensions (inches)			Weight (Lbs.)
				H	W	D	
1	Test Set TS-23/APN	Metal	7CAC-801319-217 3FK4325-23	11	6	4	6.9
1	Cord CG-107/U		1690-154431194 1F430-107.33	33-1/8 long			0.35
1	Carrying Case	Wood	3F2579	12	8-1/2	8	7.2

WAVE AND POWER METER SET TS-107/TPM-1
(TEST SET, RADAR, TS-107/TPM-1)



FUNCTIONAL DESCRIPTION:

A portable, general purpose, unit designed to measure or check the frequency of radio frequency transmitters, signal generators, and beating oscillators. In addition, it will measure the average power output of radar transmitters and provide a video output signal to a test oscilloscope for waveform analysis. Power calculations are made by referring dial readings to a calibrated chart. Resonance is indicated by a sharp change in the reading of the indicating meter. The frequency setting is shown on a counter-type indicator. This reading is converted into frequency by reference to a calibration chart within the case. The direct current meter provided may be switched to a jack for use as a miscellaneous meter.

RELATIONSHIP TO OTHER EQUIPMENT:

ELECTROMECHANICAL DESCRIPTION:

Power Supply: 4.5 volts DC, supplied by one 4.5 volt Battery (Army Type BA-27 or Navy Type 19014).

(Continued)

	AIR FORCE	NAVY	ARMY
TYPE CLASS.	Standard		
STOCK NOS.	7CAC-801319-225	F16-T-20134-5936	3F4258
PROCUREM'T INFO.: Navy Spec. OS-3087			
PROCUREM'T COG.: Navy		DESIGN COG.: Navy, BuShips	
F.I.I.N.:		FUNCTIONAL CLASS. NO.: 10.1.1	
	- Electronics Test Equipment -		TS-107/TPM-1

This project was supported by the USAF on Contract AF 33(600)28276 and monitored by WADC, ARDC - Carl L. Frederick, Bethesda, Md. - Multilithed in U. S. A.

WAVE AND POWER METER SET TS-107/TPM-1
(TEST SET, RADAR, TS-107/TPM-1)

ELECTROMECHANICAL DESCRIPTION: (Continued)

Frequency Range:
Wavemeter: 500 to 1500 megacycles per second.
Power Meter: 900 to 1350 megacycles per second.

Type of Reception: Continuous Wave, Modulated Carrier Wave, Pulsed.

Power Range, Input to Thermistor: 0.5 to 12.6 milliwatts (-3 to +11 dbm) extended to 120 milliwatts by use of the 10 decibel pad.

Direct Current Meter Range: Bridge - 0 to 15 milliamperes for power measurements. Crystal - 0 to 1.5 milliamperes. Jack - 0 to 1.5 milliamperes, for external use.

Input Impedance: 50 ohms.

Output Impedance: 50 ohms.

Direct Current Meter Resistance: 75 ohms.

Output Signal: Video signal to test oscilloscope only.

Frequency Measurements: Continuous wave power above 100 milliwatts, use thermistor. Continuous wave power below 100 milliwatts, use crystal rectifier for best results.

Accuracy: Frequency, ±3 megacycles per second (absolute). (Frequency differences of 60 megacycles per second or less can be measured to within ±0.5 megacycles per second.) Power, within ±0.5 decibel in the design range (relative), ±1 decibel (absolute).

Temperature Range: -10° F. to +120° F. (When external power is used such as that obtained from the aircraft batteries, the temperature limits are increased to from -40° F. to +140° F.

MANUFACTURERS' OR CONTRACTORS' DATA:

Western Electric Company, New York, New York; Order No. 195-MPD-43, USAF Contract No. AF 14589, 29 June 1950; Approximate Cost per Unit, **$1480.00.**

TUBE COMPLEMENT:

1 JAN-1N21B (Crystal Rectifier).

REFERENCE DATA AND LITERATURE:

TM 11-1069 (Instruction Manual).
TO 16-35TS107-2 (Maintenance Instructions).
TO 16-55-326.

SHIPPING DATA:

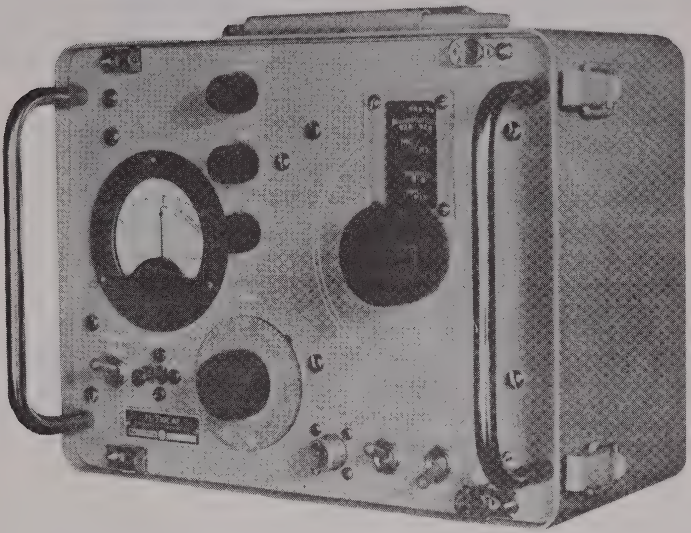
No. of Boxes	Contents & Identification	Volume (Cu. Ft.)	Over-all Dimensions (inches)			Weight Packed (Lbs.)
			H	W	D	
1	Wave and Power Meter TS-107/TPM-1 with accessories (Packed in a Water-Resistant Fiber Box)	1.38	11	12	18	26

WAVE AND POWER METER SET TS-107/TPM-1
(TEST SET, RADAR, TS-107/TPM-1)

EQUIPMENT SUPPLIED:

Quant. Per Eq'pt	Name and Nomenclature	Case Mat'l	Stock Numbers (USAF) (Navy) (Army)	Over-all Dimensions (inches)			Weight (Lbs.)
				H	W	D	
1	Wave and Power Meter TS-107/TPM-1	Ply-wood	7CAC-801319-225 F16-T-20134-5936 3F4258	7-3/16	9-9/16	14-3/4	18
1	Spare Thermistor						
1	Spare Crystal						
1	10 decibel Pad						
1	Connecting Cable			12 long			
1	Power Computor						
1	Frequency Calibration Chart						

FREQUENCY-POWER METER TS-230C/AP
(TEST SET, RADAR, TS-230C/AP)



FUNCTIONAL DESCRIPTION:

A portable, self-contained, general purpose radar test set designed to measure frequency and power of unmodulated and pulsed signals. Provision is made for the detection of a small percentage of radio frequency power so that the waveforms of pulsed signals can be displayed on an oscilloscope.

RELATIONSHIP TO OTHER EQUIPMENT:

ELECTROMECHANICAL DESCRIPTION:

Circuit Information: The radio frequency power to be measured is introduced directly into an assembly of waveguide components terminating in a broadband type power measuring head in which a thermistor is mounted parallel to the electric field. This thermistor is in one arm of a bridge circuit. A compensating thermistor, also in the bridge circuit, is physically mounted on the power measuring

(Continued)

	AIR FORCE	NAVY	ARMY
TYPE CLASS.			
STOCK NOS.	7CAC-801319-2249		
PROCUREM'T INFO.: Spec. MIL-T-15453B (Ships) dated 31 March 1954			
PROCUREM'T COG.:		DESIGN COG.: USN, BuShips	
F.I.I.N.:		FUNCTIONAL CLASS. NO.: 10.1.1	
	- Electronics Test Equipment -		TS-230C/AP

This project was supported by the USAF on Contract AF 33(600)28276 and monitored by WADC, ARDC - Carl L. Frederick, Bethesda, Md. - Multilithed in U. S. A.

FREQUENCY-POWER METER TS-230C/AP
(TEST SET, RADAR, TS-230C/AP)

ELECTROMECHANICAL DESCRIPTION: (Continued)

head, making the reading independent of the changes in ambient temperature. The frequency meter is a cavity-type unit, which includes an integral section of waveguide. The crystal detector unit consists of a short section of waveguide containing a silicon crystal. The output of the detector is cabled to a jack on the front panel.

Power Supply: Six volts supplied by four internal 1.5 volt Batteries BA-30; or 24 to 30 volts, DC, 0.25 amp, 7.5 watts, applied externally.

Frequency Range: 8500 to 9700 megacycles per second.

Power Range: 0.1 to 1000 milliwatts.

Power Ratio: -10 to +30 dbm.

Voltage Standing Wave Ratio: 1.26 maximum.

Accuracy:

Frequency Indication, Absolute: ±3.9 megacycles per second.

Frequency Indication, Relative: ±1 megacycle per second.

Power Indication, Absolute: ±2 decibels between 0.1 and 1.0 milliwatt,
±2.2 decibels between 1 and 1000 milliwatts.

Power Indication, Relative: Less than ±0.2 decibel.

Temperature Range: -40° C. to +55° C., operational.

MANUFACTURERS' OR CONTRACTORS' DATA:

Hycon Manufacturing Company, Pasadena, California; Navy Contracts Nos. NObsr-52598 and NObsr-64254.

TUBE COMPLEMENT:

1 JAN-IN23A (Crystal Rectifier).

REFERENCE DATA AND LITERATURE:

SHIPPING DATA:

No. of Boxes	Contents & Identification	Volume (Cu. Ft.)	Overall Dimensions (inches)			Weight Packed (Lbs.)
			H	W	D	

EQUIPMENT SUPPLIED:

Quant. Per Eq'pt	Name and Nomenclature	Case Mat'l	Stock Numbers (USAF) (Navy) (Army)	Overall Dimensions (inches)			Weight (Lbs.)
				H	W	D	
1	Frequency Power Meter TS-230C/AP		7CAC-801319-2249	7-7/8	10-1/2	8-9/17	18.25

FREQUENCY-POWER METER TS-295A/UP

FUNCTIONAL DESCRIPTION:

A portable, general purpose power and frequency measuring set used with an oscilloscope to permit the study of video characteristics of radar signals. The unit measures frequency by the method of minimum reaction at resonance, as well as continuous wave or pulsed power and frequency by the maximum absorption method.

RELATIONSHIP TO OTHER EQUIPMENT:

The TS-295A/UP Frequency-Power Meter is similar to Test Set TS-3/AP. Three Batteries BA-30 are required but not supplied.

ELECTROMECHANICAL DESCRIPTION:

Power Supply: 4. 5 volts DC.
Frequency Range: 3400 to 3900 ±2 megacycles per second.
Power Range: 5 to 250 milliwatts, ±1 decibel.
Direct Current Range: 0 to 1. 5 milliamp.

(Continued)

	AIR FORCE	NAVY	ARMY
TYPE CLASS.		Standard	
STOCK NOS.		F16-Q-304253-200	3F4224-295A
PROCUREM'T INFO.: Navy, Spec CS-678			
PROCUREM'T COG.: Navy		DESIGN COG.: Navy, BuShips	
F.I.I.N.:		FUNCTIONAL CLASS. NO.: 10. 1. 1	
	- Electronics Test Equipment -		TS-295A/UP

FREQUENCY-POWER METER TS-295A/UP

ELECTROMECHANICAL DESCRIPTION: (Continued)

Temperature Range: -7°C to +50°C.

MANUFACTURERS' OR CONTRACTORS' DATA:

Washington Institute of Technology, Washington 1, D.C.; Contract No. NObsr-39288.

TUBE COMPLEMENT:

None.

REFERENCE DATA AND LITERATURE:

NavShips 91164.

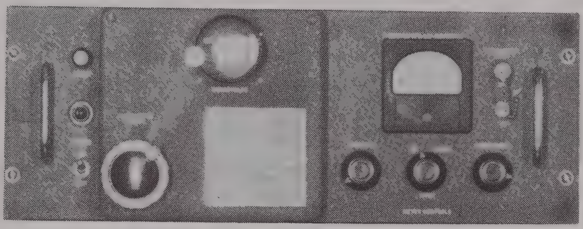
EQUIPMENT SUPPLIED:

Quant. Per Eq'pt	Name and Nomenclature	Case Mat'l	Stock Numbers (USAF) (Navy) (Army)	Overall Dimensions (inches)			Weight (Lbs.)
				H	W	D	
1	Frequency-Power Meter TS-295A/UP		F16-Q-304253-200 3F4224-295A				12.5
1	Cable						
1	CG-256/U						
1	CG-257/U						
1	CG-258/U						
1	CG-358/U						
2	Instruction Book NavShips 91164						

SHIPPING DATA:

No. of Boxes	Contents & Identification	Volume (Cu. Ft.)	Overall Dimensions (inches)			Weight Packed (Lbs.)
			H	W	D	
1	Frequency-Power Meter TS-295A/UP	3				95

FREQUENCY MEASURING UNIT AND PULSE POWER DETECTOR
CAA MODEL NO. CA-2520
(Friez Instrument Div., Bendix Aviation Corp.)



FUNCTIONAL DESCRIPTION:

A portable, general purpose, test instrument used for determining frequencies of continuous wave and pulsed radio waves and when connected to an oscilloscope, providing a means of detection, amplification, and coupling for measuring peak amplitude of pulsed power signals. Used to test Distance Measuring Equipment. A meter indicates when the wavemeter detector circuit is tuned to resonance. Frequencies are indicated by a tunable, direct reading dial graduated in megacycles per second. Provision is made for connecting an oscilloscope into the wavemeter circuit for visual monitoring of the continuous wave or pulsed signals. For power measurements a calibrating scale is provided for interpreting the oscillographic measurements. Designed for rack mounting.

RELATIONSHIP TO OTHER EQUIPMENT:

	AIR FORCE	NAVY	ARMY
TYPE CLASS.			
STOCK NOS.			
PROCUREM'T INFO.:			
PROCUREM'T COG.:		DESIGN COG.: Commercial	
F.I.I.N.:		FUNCTIONAL CLASS. NO.: 10.1.1	
	- Electronics Test Equipment -		Friez CA-2520

This project was supported by the USAF on Contract AF 33(600)28276 and monitored by WADC, ARDC - Carl L. Frederick, Bethesda, Md. - Multilithed in U. S. A.

FREQUENCY MEASURING UNIT AND PULSE POWER DETECTOR
CAA MODEL NO. CA-2520
(Friez Instrument Div., Bendix Aviation Corp.)

ELECTROMECHANICAL DESCRIPTION:

Circuit Information: For continuous wave measurements, the signal is applied to the "LO" input connector passing through an attenuator to a cavity which is resonated to the signal frequency. A crystal then detects the signal feeding it through a sensitivity control to a switch (in continuous wave position) and then directly to the meter.

For pulsed signal measurements, the signal is applied to either the "HI" or "LO" input connectors (depending upon the magnitude of the signal) and passes through the same circuit up to the switch (now in Pulse position) as in continuous wave measurements. From the switch, it passes through amplifier and vacuum tube voltmeter circuits and then to the meter. The monitor scope is tapped off the amplifier circuit. The power detector circuit is completely independent with the exception of the plate and heater supplies. The input signal passes through an attenuating cable to a detector diode. The signal is then coupled via a cathode follower to the "Power Detector Scope" connector.

Power Supply: 115 or 230 volts, AC, 60 cycles per second, single phase.

Frequency Range:
- Wavemeter: 900 to 1350 megacycles per second.
- Pulse Power Detector: 960 to 1215 megacycles per second.

Types of Reception: Wavemeter: Continuous Wave and Pulse Modulation.
Pulse Power Detector: Pulse Modulation only.

Input Impedances: 52 ohms.

Wavemeter Circuit:
- For continuous wave signals, it will measure input level range of -6 dbm to +6 dbm.
- For pulsed signals, it will measure signals with following characteristics:
  - Pulses: Single or in groups of two or three.
  - Repetition Rate: 30 to 2000 single pulses, and groups of pulses per second.
  - Pulse Rise Time: 0.1 to 1.0 microseconds.
  - Pulse Decay Time: 0.15 to 2.0 microseconds.
  - Pulse Length: 1.0 to 4.0 microseconds (all possible lengths with each rise and decay time).

Pulse Power Detector:
- Measures only pulsed radio frequency signals with the following characteristics:
  - Peak Amplitude Range: +30 dbm to +50 dbm.
  - Pulses: Groups of two or three pulses per second.
  - Repetition Rate: 30 to 2000 pulses per second.
  - Pulse Widths: Up to 2.5 microseconds.

Indicator: A 50 microampere meter with an arbitrary scale graduated from 0 to 10.

Accuracy: Wavemeter: ±1 megacycle over the tunable range (with the use of a correction chart supplied: ±0.15 megacycles).

FREQUENCY MEASURING UNIT AND PULSE POWER DETECTOR
CAA MODEL NO. CA-2520
(Friez Instrument Div., Bendix Aviation Corp.)

MANUFACTURERS' OR CONTRACTORS' DATA:

Friez Instrument Division, Bendix Aviation Corporation, Baltimore 4, Maryland; Current Quantity Price Approximately $2000.00 each, 1 February 1953; Purchase Order No. AF(33-038)514190; PR No. 103832.

TUBE COMPLEMENT:

1 RCA-6173, 4 JAN-6J6, 1 JAN-6AG5, 1 JAN-6AL5, 1 JAN-5Y3GT, 1 JAN-12AU7.

REFERENCE DATA AND LITERATURE:

Manufacturer's Instruction Book.

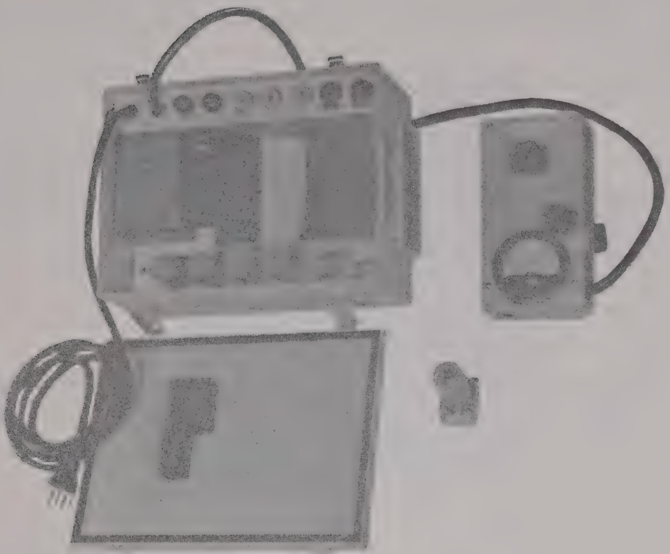
SHIPPING DATA:

No. of Boxes	Contents & Identification	Volume (Cu. Ft.)	Overall Dimensions (inches)			Weight Packed (Lbs.)
			H	W	D	
1	Frequency Measuring Unit and Pulse Power Detector (Export Packed)					105

EQUIPMENT SUPPLIED:

Quant. Per Eq'pt	Name and Nomenclature	Case Mat'l	Stock Numbers (USAF) (Navy) (Army)	Overall Dimensions (inches)			Weight (Lbs.)
				H	W	D	
1	Frequency Measuring Unit and Pulse Power Detector CAA Model CA-2520			6-31/32	19	16-1/2	35
1	Magnifying Glass (Dial reading)						
2	Wavemeter Correction Chart						
1	Power Calibrating Scale						

TEST OSCILLATOR SET AN/PRM-10
(TEST SET, RADIO, AN/PRM-10)



FUNCTIONAL DESCRIPTION:

A portable, general purpose set designed primarily to provide means for rapidly determining resonant frequencies of tuned circuits or the frequency of an incoming radio frequency signal. It may be used as a variable frequency oscillator for testing radio receivers; as an absorption type wavemeter; as an oscillating detector; for measurement of capacitance, inductance, relative "Q", mutual inductance; and also as a marker for use with a sweep frequency generator.

RELATIONSHIP TO OTHER EQUIPMENT:

Used to test signal channel Ground UHF Receiver and Transmitters. Military version of "Megacycle Meter" or "Grid-Dip Meter." May be used as a substitute for Measurements Corporation Model 59 Megacycle Meter.

	AIR FORCE	NAVY	ARMY
TYPE CLASS.	Standard		
STOCK NOS.	7CAC-801319-13		
PROCUREM'T INFO.:	Spec. MIL-T-4220 (USAF) dated 31 March 1952		
PROCUREM'T COG.:	USAF	DESIGN COG.:	USAF, Rome
F.I.I.N.:		FUNCTIONAL CLASS. NO.:	10.1.2
	- Electronics Test Equipment -		AN/PRM-10

This project was supported by the USAF on Contract AF 33(600)28276 and monitored by WADC, ARDC - Carl L. Frederick, Bethesda, Md. - Multilithed in U.S.A.

TEST OSCILLATOR SET AN/PRM-10
(TEST SET, RADIO, AN/PRM-10)

ELECTROMECHANICAL DESCRIPTION:

Circuit Information: Consists of a signal generator using a Colpit's circuit, an oscillating wavemeter (grid-dip meter) and a non-oscillating detector (absorption type wavemeter).

Power Supply: 115 volts ±10%, AC, single phase, 50 to 1000 cycles per second, 20 watts.

Frequency Range: 2 to 400 megacycles per second with seven plug-in coils.

Type of Transmission: Continuous Wave, Amplitude Modulated Carrier.

Modulation from internal 1000 cycle modulator fixed at approximately 30%. May be modulated from 50 to 10,000 cycles per second from external source. Approximately 1 volt is required across 150,000 ohms for 30% modulation.

Accuracy: ±2% of indicated reading.

Temperature Range: -54° C. to +71° C.

MANUFACTURERS' OR CONTRACTORS' DATA:

Measurements Corporation, Boonton, New Jersey; Contract No. AF28(099)191; Approximate Cost per Unit, $90.00, March 1950.

TUBE COMPLEMENT:

1 JAN-955, 1 JAN-6X4, 1 JAN-6005, 1 JAN-OA2, 1 JAN-6AV6.

REFERENCE DATA AND LITERATURE:

Manufacturer's Handbook of Instructions for Test Oscillator Set, AN/PRM-10; TO 16-30PRM10-1 (Operation Instructions); TO 16-30PRM10-2 (Service Instructions); TO 16-30PRM10-3 (Overhaul Instructions); TO 16-30PRM10-4 (Illustrated Parts Breakdown); TO 16-30PRM10-11 (Operating Instructions); TO 16-30PRM10-12 (Service Instructions); TO 16-30PRM10-13 (Overhaul Instructions); TO 16-30PRM10-14 (Illustrated Parts Breakdown).

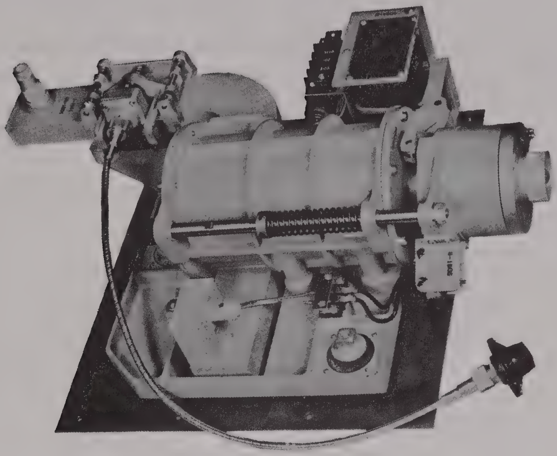
SHIPPING DATA:

No. of Boxes	Contents & Identification	Volume (Cu. Ft.)	Overall Dimensions (inches)			Weight Packed (Lbs.)
			H	W	D	

EQUIPMENT SUPPLIED:

Quant. Per Eq'pt	Name and Nomenclature	Case Mat'l	Stock Numbers (USAF) (Navy) (Army)	Overall Dimensions (inches)			Weight (Lbs.)
				H	W	D	
1	Test Oscillator Set AN/PRM-10	Aluminum Alloy	7CAC-801319-13	11-3/8	5-1/16	9-5/16	14

RADIO TEST SET AN/TRM-3(XN)



FUNCTIONAL DESCRIPTION:

A general purpose sweep generator with a self-contained five-inch cathode ray ube indicator. The test set is designed to adjust and align tuned circuits. It provides internal amplitude and frequency modulation and calibrated output level signals.

RELATIONSHIP TO OTHER EQUIPMENT:

ELECTROMECHANICAL DESCRIPTION:

Circuit Information: The equipment contains RF signal circuits, indicating circuits, power supply circuits, and a frequency identifier generator. A variable oscillator produces an RF output signal of known frequency. This oscillator can also provide non-swept, modulated or unmodulated CW signals. An attenuator in the oscillator circuit is calibrated to indicate the RF output level in microvolts and

(Continued)

	AIR FORCE	NAVY	ARMY
TYPE CLASS.			
STOCK NOS.			
PROCUREM'T INFO.:			
PROCUREM'T COG.: USN		DESIGN COG.: USN, BuAer	
F.I.I.N.:		FUNCTIONAL CLASS. NO.: 10.1.2	
	- Electronics Test Equipment -		AN/TRM-3(XN)

his project was supported by the USAF on Contract AF 33(600)28276 and monitored by WADC, ARDC - Carl L. Frederick, Bethesda, Md. - Multilithed in U. S. A.

RADIO TEST SET AN/TRM-3(XN)

ELECTROMECHANICAL DESCRIPTION: (Continued)

in decibels. The frequency identifier generator provides equally spaced amplitude pips for visual calibration of an external signal. The indicating circui includes a cathode ray tube with suitable circuits for trace positioning, focusing, and deflection. The power supply circuit furnishes all necessary operating voltages for the equipment when supplied with the required external AC power. In addition to these circuits, one high impedance probe, one dynamic probe, and a detector assembly are provided.

Power Supply: 115 volts, AC, single-phase, 50 to 1600 cycles per second.
Frequency Range: 15 to 400 megacycles per second.
Voltage Output: 1 to 100,000 microvolts, calibrated.
Power Output: -126 to -30 decibels, calibrated.
Output Impedance: 50 ohms.
Modulation Data: 400 cycles per second, internal amplitude modulation.
30 to 150 cycles per second, internal sawtooth sweep.
Deviation variable in three ranges: 0 to ±150 kilocycles per second, 0 to ±1.5 megacycles per second, ±1.5 to 5 megacycles per second; and ±5 to 20 megacycles per second frequency modulated.
Accuracy: ±1% of indicated Continuous Wave frequency.
±0.02% of indicated frequency modulation.
±1 decibel of indicated power output.

MANUFACTURERS' OR CONTRACTORS' DATA:

Transitron, Inc., 154 Spring Street, New York 12, New York; Contract No. NOas 54-803F (Production).

A.R.F. Products, Inc., 7627 West Lake Street, River Forest, Illinois; Contract No. NOa(s) 10357 (Development).

TUBE COMPLEMENT:

REFERENCE DATA AND LITERATURE:

SHIPPING DATA:

No. of Boxes	Contents & Identification	Volume (Cu. Ft.)	Overall Dimensions (inches)			Weight Packed (Lbs.)
			H	W	D	

RADIO TEST SET AN/TRM-3(XN)

EQUIPMENT SUPPLIED:

Quant. Per Eq'pt	Name and Nomenclature	Case Mat'l	Stock Numbers (USAF) (Navy) (Army)	Overall Dimensions (inches)			Weight (Lbs.)
				H	W	D	
1	Radio Test Set AN/TRM-3(XN)						285
	Including:						
1	RF Signal Generator SG-24(XN)/ TRM-3			16	19	19	
1	Frequency Calibrator FR-59/TRM-3						
1	RF Output Cable						
1	Power Cable CX-337A/U			96 long			

TEST OSCILLATOR BC-376-A
(GENERATOR, SIGNAL, BC-376-A)

FUNCTIONAL DESCRIPTION:

A special purpose, portable unit used as a low power oscillator and heterodyne frequency meter in conjunction with Test Indication BE-67 for adjustment of marker beacon receivers and transmitters.

RELATIONSHIP TO OTHER EQUIPMENT:

Used to test Radio Beacons such as AN/ARN-12.

Various production models differ in dimensions and weight. Models A, B, C, D, and E are similar electrically and mechanically. Models F and G are similar electrically and mechanically and are screen grid modulated while all other models are plate modulated. Model H is the lightest in weight and uses iron core slugs for tuning the modulator stage.

ELECTROMECHANICAL DESCRIPTION:

Circuit Information: A crystal oscillator, operating at 12.5 megacycles per second, is used to excite a frequency tripler stage which drives a final doubler stage.

(Continued)

	AIR FORCE	NAVY	ARMY
TYPE CLASS.	Limited Standard		
STOCK NOS.	1690-327244700		3F3976
PROCUREM'T INFO.:	Spec. MIL-T-4466(USAF) dated 30 April 1952		
PROCUREM'T COG.:	USAF	DESIGN COG.:	USAF, C&N
F.I.I.N.:		FUNCTIONAL CLASS. NO.:	10.1.2
	- Electronics Test Equipment -		BC-376-A

his project was supported by the USAF on Contract AF 33(600)28276 and monitored by WADC, ARDC - Carl L. Frederick, Bethesda, Md. - Multilithed in U. S. A.

TEST OSCILLATOR BC-376-A
(GENERATOR, SIGNAL, BC-376-A)

ELECTROMECHANICAL DESCRIPTION: (Continued)

This provides a 75 megacycle radio frequency output that may be amplitude modulated, if desired, with audio frequency signals supplied by the modulator stage. Plate modulation (approximately 35%) in doubler tube stage is used.

Antenna: The antenna is mounted horizontally so as to produce horizontally polarized waves and is electrically connected to the doubler stage output by a flexible transmission line.

Power Supply: 1.5 volts, supplied by one Battery BA-35 (1.5 volts). 90 volts, supplied by two Batteries, BA-36 (45 volts).

Frequency Range: 75 megacycles per second only.

Modulation Frequencies: 400, 1300 or 3000 cycles per second.

Type of Transmission: Amplitude Modulated Carrier.

Type of Reception: Continuous Wave.

Effective Range: 10 to 20 feet.

Field Strength: 900 microvolts per meter at 100 feet from test oscillator with antennas of oscillator and field strength meter parallel and mutually perpendicular to a line between centers of antennas.

Accuracies: Over the temperature range -26.1° C. to +55° C., the carrier frequency drift with temperature is less than 150 cycles per second, ±2% variation in modulation frequency.

MANUFACTURERS' OR CONTRACTORS' DATA:

Packard Bell Company, 3443 Wilshire Boulevard, Los Angeles 5, California; Approximate Cost per Unit, $200.00.

TUBE COMPLEMENT:

3 JAN-1A5GT, 1 JAN-1C5GT.

REFERENCE DATA AND LITERATURE:

TO 16-40BC376-2 (Maintenance Instructions).
TO 16-55-370 (Spare Parts List).
SB 11-100-69 (Serviceability Standards).

SHIPPING DATA:

No. of Boxes	Contents & Identification	Volume (Cu. Ft.)	Overall Dimensions (inches)			Weight Packed (Lbs.)
			H	W	D	
1	Test Oscillator, BC-376-A with accessories (Water Resistant, Solid Fiber Box)	0.75	16	10	8	34

EQUIPMENT SUPPLIED:

Quant. Per Eq'pt	Name and Nomenclature	Case Mat'l	Stock Numbers (USAF) (Navy) (Army)	Overall Dimensions (inches)			Weight (Lbs.)
				H	W	D	
1	Test Oscillator BC-376-A (Including Tubes)	Metal	1690-327244700 3F3976	12-5/16	9-3/4	7-3/4	21.5

TEST OSCILLATOR BC-376-B
(GENERATOR, SIGNAL, BC-376-B)

UNCTIONAL DESCRIPTION:

A special purpose, portable unit used as a low power oscillator and heterodyne requency meter in conjunction with Test Indicator BE-67 for adjustment of marker eacon receivers and transmitters.

ELATIONSHIP TO OTHER EQUIPMENT:

Used to test Radio Beacons such as AN/ARN-12.

Various production models differ in dimensions and weight. Models A, B, C, D, nd E are similar electrically and mechanically. Models F and G are similar elecrically and mechanically and are screen grid modulated while all other models are late modulated. Model H is the lightest in weight and uses iron core slugs for tunng the modulator stage.

LECTROMECHANICAL DESCRIPTION:

ircuit Information: A crystal oscillator, operating at 12.5 megacycles per second, is used to excite a frequency tripler stage which drives a final doubler stage.

(Continued)

	AIR FORCE	NAVY	ARMY
TYPE CLASS.	Limited Standard		
STOCK NOS.	1690-327268000		3F3976
PROCUREM'T INFO.:	Spec. MIL-T-4466 (USAF) dated 30 April 1952		
PROCUREM'T COG.:	USAF	DESIGN COG.:	USAF, C&N
F.I.I.N.:		FUNCTIONAL CLASS. NO.:	10.1.2
	- Electronics Test Equipment -		BC-376-B

is project was supported by the USAF on Contract AF 33(600)28276 and monitored by WADC, ARDC - Carl L. Frederick, Bethesda, Md. - Multilithed in U. S. A.

TEST OSCILLATOR BC-376-B
(GENERATOR, SIGNAL, BC-376-B)

ELECTROMECHANICAL DESCRIPTION: (Continued)

This provides a 75 megacycle radio frequency output that may be amplitude modulated, if desired, with audio frequency signals supplied by the modulator stage.

Antenna: The antenna is mounted horizontally so as to produce horizontally polarized waves and is electrically connected to the doubler stage output by a flexible transmission line.

Power Supply: 1.5 volts, supplied by one Battery BA-35 (1.5 volts). 90 volts, supplied by two Batteries BA-36 (45 volts).

Frequency Range: 75 megacycles per second only.

Modulation Frequencies: 400, 1300 or 3000 cycles per second.

Type of Transmission: Amplitude Modulated Carrier.

Type of Reception: Continuous Wave.

Effective Range: 10 to 20 feet.

Field Strength: 900 microvolts per meter at 100 feet from test oscillator with antennas of oscillator and field strength meter parallel and mutually perpendicular to a line between centers of antennas.

Accuracies: Over the temperature range -26.1° C. to +55° C., the carrier frequency drift with temperature is less than 150 cycles per second, ±2% variation in modulation frequency.

MANUFACTURERS' OR CONTRACTORS' DATA:

Packard Bell Company, 3443 Wilshire Boulevard, Los Angeles 5, California; Approximate Cost per Unit, $200.00.

TUBE COMPLEMENT:

3 JAN-1A5GT, 1 JAN-1C5GT.

REFERENCE DATA AND LITERATURE:

TO 16-40BC376-2 (Maintenance Instructions).
TO 16-55-370 (Spare Parts List).
SB 11-100-69 (Serviceability Standards).

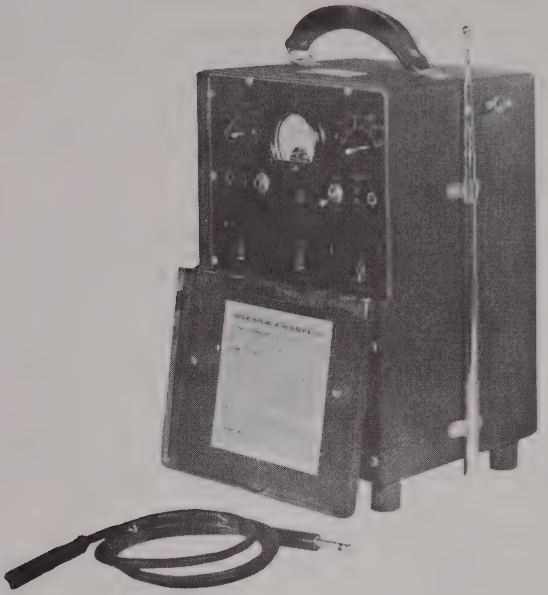
SHIPPING DATA:

No. of Boxes	Contents & Identification	Volume (Cu. Ft.)	Overall Dimensions (inches)			Weight Packed (Lbs.)
			H	W	D	
1	Test Oscillator, BC-376-B with accessories (Water Resistant, Solid Fiber Box)	0.74	16	10	8	34

EQUIPMENT SUPPLIED:

Quant. Per Eq'pt	Name and Nomenclature	Case Mat'l	Stock Numbers (USAF) (Navy) (Army)	Overall Dimensions (inches)			Weight (Lbs.)
				H	W	D	
1	Test Oscillator BC-376-B (Including Tubes)	Metal	1690-327268000 3F3976	12-5/16	9-3/4	7-3/4	21.5

TEST OSCILLATOR BC-376-C
(GENERATOR, SIGNAL, BC-376-C)



FUNCTIONAL DESCRIPTION:

A special purpose, portable unit used as a low power oscillator and heterodyne frequency meter in conjunction with Test Indicator BE-67 for adjustment of marker beacon receivers and transmitters.

RELATIONSHIP TO OTHER EQUIPMENT:

Used to test Radio Beacons such as AN/ARN-12.

Various production models differ in dimensions and weight. Models A, B, C, D, and E are similar electrically and mechanically. Models F and G are similar electrically and mechanically and are screen grid modulated while all other models are plate modulated. Model H is the lightest in weight and uses iron core slugs for tuning the modulator stage.

ELECTROMECHANICAL DESCRIPTION:

Circuit Information: A crystal oscillator, operating at 12.5 megacycles per second, is used to excite a frequency tripler stage which drives a final doubler stage.

(Continued)

	AIR FORCE	NAVY	ARMY
TYPE CLASS.	Limited Standard		
STOCK NOS.	1690-327274000		3F3976
PROCUREM'T INFO.:	Spec. MIL-T-4466 (USAF) dated 30 April 1952		
PROCUREM'T COG.:	USAF	DESIGN COG.:	USAF, C&N
F.I.I.N.:		FUNCTIONAL CLASS. NO.:	10.1.2

s project was supported by the USAF on Contract AF 33(600)28276 and monitored by WADC, ARDC - Carl L. Frederick, Bethesda, Md. - Multilithed in U. S. A.

TEST OSCILLATOR BC-376C
(GENERATOR, SIGNAL, BC-376-C)

ELECTROMECHANICAL DESCRIPTION: (Continued)

This provides a 75 megacycle radio frequency output that may be amplitude modulated, if desired, with audio frequency signals supplied by the modulator stage.

Antenna: The antenna is mounted horizontally so as to produce horizontally polarized waves and is electrically connected to the doubler stage output by a flexible transmission line.

Power Supply: 1.5 volts, supplied by one Battery BA-35 (1.5 volts). 90 volts, supplied by two Batteries BA-36 (45 volts).

Frequency Range: 75 megacycles per second only.

Modulation Frequencies: 400, 1300 or 3000 cycles per second.

Type of Transmission: Amplitude Modulated Carrier.

Type of Reception: Continuous Wave.

Effective Range: 10 to 20 feet.

Field Strength: 900 microvolts per meter at 100 feet from test oscillator with antennas of oscillator and field strength meter parallel and mutually perpendicular to a line between centers of antennas.

Accuracies: Over the temperature range of -26.1°C. to +55°C., the frequency drift with temperature is less than 150 cycles per second, ±2% variation in modulation frequency.

MANUFACTURERS' OR CONTRACTORS' DATA:

Packard Bell Company, 3443 Wilshire Boulevard, Los Angeles 5, California; Approximate Cost per Unit, $200.00.

TUBE COMPLEMENT:

3 JAN-1A5GT, 1 JAN-1C5GT.

REFERENCE DATA AND LITERATURE:

TO 16-40BC376-2 (Maintenance Instructions).
TO 16-55-370 (Spare Parts List).
SB 11-100-69 (Serviceability Standards).

SHIPPING DATA:

No. of Boxes	Contents & Identification	Volume (Cu. Ft.)	Overall Dimensions (inches)			Weight Packed (Lbs.)
			H	W	D	
1	Test Oscillator, BC-376-C with accessories (Water Resistant, Solid Fiber Box)	0.74	16	10	8	34

EQUIPMENT SUPPLIED:

Quant. Per Eq'pt	Name and Nomenclature	Case Mat'l	Stock Numbers (USAF) (Navy) (Army)	Overall Dimensions (inches)			Weight (Lbs.)
				H	W	D	
1	Test Oscillator BC-376-C (Including Tubes)	Metal	1690-327274000 3F3976	12-5/16	9-3/4	7-3/4	21.5

TEST OSCILLATOR BC-376-D
(GENERATOR, SIGNAL, BC-376-D)

UNCTIONAL DESCRIPTION:

A special purpose, portable unit used as a low power oscillator and heterodyne requency meter in conjunction with Test Indicator BE-67 for adjustment of marker eacon receivers and transmitters.

ELATIONSHIP TO OTHER EQUIPMENT:

Used to test Radio Beacons such as AN/ARN-12.

Various production models differ in dimensions and weight. Models A, B, C, D, nd E are similar electrically and mechanically. Models F and G are similar elecrically and mechanically and are screen grid modulated while all other models are late modulated. Model H is the lightest in weight and uses iron core slugs for tunng the modulator stage.

LECTROMECHANICAL DESCRIPTION:

ircuit Information: A crystal oscillator, operating at 12.5 megacycles per second, is used to excite a frequency tripler stage which drives a final doubler stage.

(Continued)

	AIR FORCE	NAVY	ARMY
TYPE CLASS.	Limited Standard		
STOCK NOS.	1690-327276000		3F3976
PROCUREM'T INFO.:	Spec. MIL-T-4466 (USAF) dated 30 April 1952		
PROCUREM'T COG.:	USAF	DESIGN COG.:	USAF, C&N
F.I.I.N.:		FUNCTIONAL CLASS. NO.:	10.1.2
	- Electronics Test Equipment -		BC-376-D

ls project was supported by the USAF on Contract AF 33(600)28276 and monitored by WADC, ARDC - Carl L. Frederick, Bethesda, Md. - Multilithed in U. S. A.

TEST OSCILLATOR BC-376-D
(GENERATOR, SIGNAL, BC-376-D)

ELECTROMECHANICAL DESCRIPTION: (Continued)

This provides a 75 megacycle radio frequency output that may be amplitude modulated, if desired, with audio frequency signals supplied by the modulator stage.

Antenna: The antenna is mounted horizontally so as to produce horizontally polarized waves and is electrically connected to the doubler stage output by a flexible transmission line.

Power Supply: 1.5 volts, supplied by one Battery BA-35 (1.5 volts). 90 volts, supplied by two Batteries, BA-36 (45 volts).

Frequency Range: 75 megacycles per second only.

Modulation Frequencies: 400, 1300, or 3000 cycles per second.

Type of Transmission: Amplitude Modulated Carrier.

Type of Reception: Continuous Wave.

Effective Range: 10 to 20 feet.

Field Strength: 900 microvolts per meter at 100 feet from test oscillator with antennas of oscillator and field strength meter parallel and mutually perpendicular to a line between centers of antennas.

Accuracies: Over the temperature range of -26.1°C. to +55°C., the frequency drift with temperature is less than 150 cycles per second, ±2% variation in modulation frequency.

MANUFACTURERS' OR CONTRACTORS' DATA:

Packard Bell Company, 3443 Wilshire Boulevard, Los Angeles 5, California; Approximate Cost per Unit, $200.00.

TUBE COMPLEMENT:

3 JAN-1A5GT, 1 JAN-1C5GT.

REFERENCE DATA AND LITERATURE:

TO 16-40BC376-2 (Maintenance Instructions).
TO 16-55-370 (Spare Parts List).
SB 11-100-69 (Serviceability Standards).

SHIPPING DATA:

No. of Boxes	Contents & Identification	Volume (Cu. Ft.)	Overall Dimensions (inches)			Weight Packed (Lbs.)
			H	W	D	
1	Test Oscillator, BC-376-D with accessories (Water Resistant, Solid Fiber Box)	0.74	16	10	8	34

EQUIPMENT SUPPLIED:

Quant. Per Eq'pt.	Name and Nomenclature	Case Mat'l	Stock Numbers (USAF) (Navy) (Army)	Overall Dimensions (inches)			Weight (Lbs.)
				H	W	D	
1	Test Oscillator BC-376-D (Including Tubes)	Metal	1690-327276000 3F3976	12-5/16	9-3/4	7-3/4	21.5

TEST OSCILLATOR BC-376-E
(GENERATOR, SIGNAL, BC-376-E)

FUNCTIONAL DESCRIPTION:

A special purpose, portable unit used as a low power oscillator and heterodyne frequency meter in conjunction with Test Indicator BE-67 for adjustment of marker eacon receivers and transmitters.

RELATIONSHIP TO OTHER EQUIPMENT:

Used to test Radio Beacons such as AN/ARN-12.

Various production models differ in dimensions and weight. Models A, B, C, D, and E are similar electrically and mechanically. Models F and G are similar electrically and mechanically and are screen grid modulated while all other models are plate modulated. Model H is the lightest in weight and uses iron core slugs for tuning the modulator stage.

ELECTROMECHANICAL DESCRIPTION:

Circuit Information: A crystal oscillator, operating at 12.5 megacycles per second, is used to excite a frequency tripler stage which drives a final doubler stage.

(Continued)

	AIR FORCE	NAVY	ARMY
TYPE CLASS.	Limited Standard		
STOCK NOS.	1690-327282000		3F3976
PROCUREM'T INFO.:	Spec. MIL-T-4466 (USAF) dated 30 April 1952		
PROCUREM'T COG.:	USAF	DESIGN COG.:	USAF, C&N
F.I.I.N.:		FUNCTIONAL CLASS. NO.:	10.1.2
	- Electronics Test Equipment -		BC-376-E

his project was supported by the USAF on Contract AF 33(600)28276 and monitored by WADC, ARDC - Carl L. Frederick, Bethesda, Md. - Multilithed in U.S.A.

TEST OSCILLATOR BC-376-E
(GENERATOR, SIGNAL, BC-376-E)

ELECTROMECHANICAL DESCRIPTION: (Continued)

This provides a 75 megacycle radio frequency output that may be amplitude modulated, if desired, with audio frequency signals supplied by the modulator stage

Antenna: The antenna is mounted horizontally so as to produce horizontally polarized waves and is electrically connected to the doubler stage output by a flexible transmission line.

Power Supply: 1.5 volts, supplied by one Battery, BA-35(1.5 volts). 90 volts, supplied by two Batteries, BA-36 (45 volts).

Frequency Range: 75 megacycles per second only.

Modulation Frequencies: 400, 1300, or 3000 cycles per second.

Type of Transmission: Amplitude Modulated Carrier.

Type of Reception: Continuous Wave.

Effective Range: 10 to 20 feet.

Field Strength: 900 microvolts per meter at 100 feet from test oscillator with antennas of oscillator and field strength meter parallel and mutually perpendicular to a line between centers of antennas.

Accuracies: Over the temperature range of -26.1 °C. to +55 °C., the frequency drift with temperature is less than 150 cycles per second, ±2% variation in modulation frequency.

MANUFACTURERS' OR CONTRACTORS' DATA:

Packard Bell Company, 3443 Wilshire Boulevard, Los Angeles 5, California;

Approximate Cost per Unit, $200.00.

TUBE COMPLEMENT:

3 JAN-1A5GT, 1 JAN-1C5GT.

REFERENCE DATA AND LITEARTURE:

TO 16-40BC376-2 (Maintenance Instructions).

TO 16-55-370 (Spare Parts List).

SB 11-100-69 (Serviceability Standards).

SHIPPING DATA:

No. of Boxes	Contents & Identification	Volume (Cu. Ft.)	Overall Dimensions (inches)			Weight Packed (Lbs.)
			H	W	D	
1	Test Oscillator, BC-376-E with accessories (Water Resistant, Solid Fiber Box)	0.74	16	10	8	34

EQUIPMENT SUPPLIED:

Quant. Per Eq'pt	Name and Nomenclature	Case Mat'l	Stock Numbers (USAF) (Navy) (Army)	Overall Dimensions (inches)			Weight (Lbs.)
				H	W	D	
1	Test Oscillator BC-376-E (Including Tubes)	Metal	1690-327282000 3F3976	12-5/16	9-3/16	7-3/4	21.5

TEST OSCILLATOR BC-376-F
(GENERATOR, SIGNAL, BC-376-F)

UNCTIONAL DESCRIPTION:

A special purpose, portable unit used as a low power oscillator and heterodyne requency meter in conjunction with Test Indicator BE-67 for adjustment of marker eacon receivers and transmitters.

ELATIONSHIP TO OTHER EQUIPMENT:

Used to test Radio Beacons such as AN/ARN-12.

Various production models differ in dimensions and weight. Models A, B, C, D, nd E are similar electrically and mechanically. Models F and G are similar elec-rically and mechanically and are screen grid modulated while all other models are late modulated. Model H is the lightest in weight and uses iron core slugs for tun-ng the modulator stage.

LECTROMECHANICAL DESCRIPTION:

ircuit Information: A crystal oscillator, operating at 12.5 megacycles per second, is used to excite a frequency tripler stage which drives a final doubler stage.

(Continued)

	AIR FORCE	NAVY	ARMY
TYPE CLASS.	Limited Standard		
STOCK NOS.	1690-327288000		3F3976
PROCUREM'T INFO.:	Spec. MIL-T-4466 (USAF) dated 30 April 1952		
PROCUREM'T COG.:	USAF	DESIGN COG.:	USAF, C&N
F.I.I.N.:		FUNCTIONAL CLASS. NO.:	10.1.2
	- Electronics Test Equipment -		BC-376-F

s project was supported by the USAF on Contract AF 33(600)28276 and monitored by WADC, ARDC - Carl L. Frederick, Bethesda, Md. - Multilithed in U. S. A.

TEST OSCILLATOR BC-376-F
(GENERATOR, SIGNAL, BC-376-F)

ELECTROMECHANICAL DESCRIPTION: (Continued)

This provides a 75 megacycle radio frequency output that may be amplitude modulated, if desired, with audio frequency signals supplied by the modulator stage.

Antenna: The antenna is mounted horizontally so as to produce horizontally polarized waves and is electrically connected to the doubler stage output by a flexible transmission line.

Power Supply: 1.5 volts, supplied by one Battery BA-35 (1.5 volts). 90 volts, supplied by two Batteries BA-36 (45 volts).

Frequency Range: 75 megacycles per second only.

Modulation Frequencies: 400, 1300 or 3000 cycles per second.

Type of Transmission: Amplitude Modulated Carrier.

Type of Reception: Continuous Wave.

Effective Range: 10 to 20 feet.

Field Strength: 900 microvolts per meter at 100 feet from test oscillator with antennas of oscillator and field strength meter parallel and mutually perpendicular to a line between centers of antennas.

Accuracies: Over the temperature range of -26.1°C. to +55°C., the frequency drift with temperature is less than 150 cycles per second, ±2% variation in modulation frequency.

MANUFACTURERS' OR CONTRACTORS' DATA:

Packard Bell Company, 3443 Wilshire Boulevard, Los Angeles 5, California; Approximate Cost per Unit, $200.00.

TUBE COMPLEMENT:

3 JAN-1A5GT, 1 JAN-1C5GT.

REFERENCE DATA AND LITERATURE:

TO 16-40BC376-2 (Maintenance Instructions).
TO 16-55-370 (Spare Parts List).
SB 11-100-69 (Serviceability Standards).

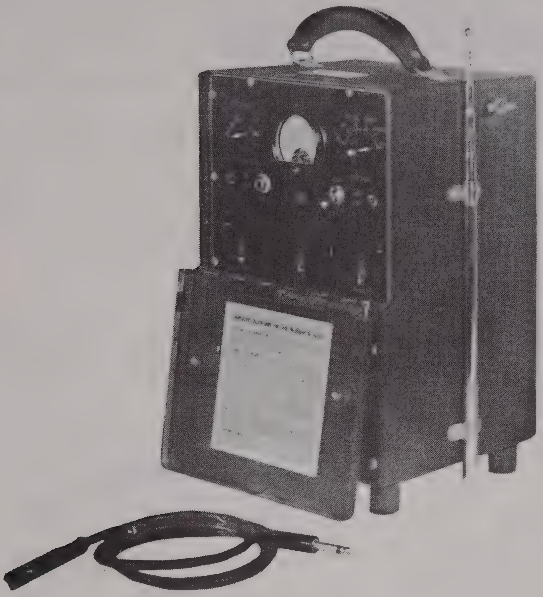
SHIPPING DATA:

No. of Boxes	Contents & Identification	Volume (Cu. Ft.)	Overall Dimensions (inches)			Weight Packed (Lbs.)
			H	W	D	
1	Test Oscillator, BC-376-F, with accessories (Water Resistant, Solid Fiber Box)	0.74	16	10	8	34

EQUIPMENT SUPPLIED:

Quant. Per Eq'pt	Name and Nomenclature	Case Mat'l	Stock Numbers (USAF) (Navy) (Army)	Overall Dimensions (inches)			Weight (Lbs.)
				H	W	D	
1	Test Oscillator BC-376-F (Including Tubes)	Metal	1690-327288000 3F3976	12-5/16	9-3/4	7-3/4	21.5

TEST OSCILLATOR BC-376-G
(GENERATOR, SIGNAL, BC-376-G)



UNCTIONAL DESCRIPTION:

A special purpose, portable unit used as a low power oscillator and heterodyne requency meter in conjunction with Test Indicator BE-67 for adjustment of marker eacon receivers and transmitters.

ELATIONSHIP TO OTHER EQUIPMENT:

Used to test Radio Beacons such as AN/ARN-12.

Various production models differ in dimensions and weight. Models A, B, C, D, nd E are similar electrically and mechanically. Models F and G are similar elecrically and mechanically and are screen grid modulated while all other models are late modulated. Model H is the lightest in weight and uses iron core slugs for tunng the modulator stage.

BC-376-H is interchangeable with BC-376-G.

LECTROMECHANICAL DESCRIPTION:

ircuit Information: A crystal oscillator, operating at 12.5 megacycles per second, is used to excite a frequency tripler stage which drives a final doubler stage.

(Continued)

	AIR FORCE	NAVY	ARMY
TYPE CLASS.	Limited Standard		
STOCK NOS.	1690-327293000		3F3976
PROCUREM'T INFO.:	Spec. MIL-T-4466 (USAF) dated 30 April 1952		
PROCUREM'T COG.:	USAF	DESIGN COG.:	USAF, C&N
F.I.I.N.:		FUNCTIONAL CLASS. NO.:	10.1.2

is project was supported by the USAF on Contract AF 33(600)28276 and monitored by WADC, ARDC - Carl L. Frederick, Bethesda, Md. - Multilithed in U. S. A.

TEST OSCILLATOR BC-376-G
(GENERATOR, SIGNAL, BC-376-G)

ELECTROMECHANICAL DESCRIPTION: (Continued)

This provides a 75 megacycle radio frequency output that may be amplitude modulated, if desired, with audio frequency signals supplied by the modulator stage.

Antenna: The antenna is mounted horizontally so as to produce horizontally polarized waves and is electrically connected to the doubler stage output by a flexible transmission line.

Power Supply: 1.5 volts, supplied by one Battery BA-35 (1.5 volts). 90 volts, supplied by two Batteries BA-36 (45 volts).

Frequency Range: 75 megacycles per second only.

Modulation Frequencies: 400, 1300 or 3000 cycles per second.

Type of Transmission: Amplitude Modulated Carrier.

Type of Reception: Continuous Wave.

Effective Range: 10 to 20 feet.

Field Strength: 900 microvolts per meter at 100 feet from test oscillator with antennas of oscillator and field strength meter parallel and mutually perpendicular to a line between centers of antennas.

Accuracies: Over the temperature range of -26.1°C. to +55°C., the frequency drift with temperature is less than 150 cycles per second, ±2% variation in modulation frequency.

MANUFACTURERS' OR CONTRACTORS' DATA:

Packard Bell Company, 3443 Wilshire Boulevard, Los Angeles 5, California;
Approximate Cost per Unit, $200.00.

TUBE COMPLEMENT:

3 JAN-1A5GT, 1 JAN-1C5GT.

REFERENCE DATA AND LITERATURE:

TO 16-40BC376-2 (Maintenance Instructions).
TO 16-55-370 (Spare Parts List).
SB 11-100-69 (Serviceability Standards).

SHIPPING DATA:

No. of Boxes	Contents & Identification	Volume (Cu. Ft.)	Overall Dimensions (inches)			Weight Packed (Lbs.)
			H	W	D	
1	Test Oscillator, BC-376-G with accessories (Water-Resistant, Solid Fiber Box)	0.74	16	10	8	54

EQUIPMENT SUPPLIED:

Quant. Per	Name and Nomenclature	Case Mat'l	Stock Numbers (USAF) (Navy) (Army)	Overall Dimensions (inches)			Weight (Lbs.)
				H	W	D	
1	Test Oscillator BC-376-G (Including Tubes)	Metal	1690-327293000 3F3976	12-5/16	9-3/4	7-3/4	

TEST OSCILLATOR BC-376-H
(GENERATOR, SIGNAL, BC-376-H)

FUNCTIONAL DESCRIPTION:

A special purpose, portable unit used as a low power oscillator and heterodyne frequency meter in conjunction with Test Indicator BE-67 for adjustment of marker beacon receivers and transmitters.

RELATIONSHIP TO OTHER EQUIPMENT:

Used to test Radio Beacons such as AN/ARN-12.

Various production models differ in dimensions and weight. Models A, B, C, D, and E are similar electrically and mechanically. Models F and G are similar in electrically and mechanically and are screen grid modulated while all other models are plate modulated. Model H is the lightest in weight and uses iron core slugs for tuning the modulator stage.

BC-376-H is interchangeable with BC-376-G.

ELECTROMECHANICAL DESCRIPTION:

Circuit Information: A crystal oscillator, operating at 12.5 megacycles per second, is used to excite a frequency tripler stage which drives a final doubler stage. This provides a 75 megacycle radio frequency output that may be amplitude modulated, if desired, with signals supplied by the modulator stage. Screen grid

(Continued)

	AIR FORCE	NAVY	ARMY
TYPE CLASS.	Standard		
STOCK NOS.	7CAC-363929	ASO-R16-0-1800	3F3976H

PROCUREM'T INFO.: Spec. MIL-T-4466 (USAF) dated 30 April 1952

PROCUREM'T COG.: USAF DESIGN COG.: USAF, C&N

F.I.I.N.: FUNCTIONAL CLASS. NO.: 10.1.2

is project was supported by the USAF on Contract AF 33(600)28276 and monitored by WADC, ARDC - Carl L. Frederick, Bethesda, Md. - Multilithed in U. S. A.

TEST OSCILLATOR BC-376-H
(GENERATOR, SIGNAL, BC-376-H)

ELECTROMECHANICAL DESCRIPTION: (Continued)

modulation in the doubler tube stage is used (Approximately 35%).

Antenna: The antenna is mounted horizontally so as to produce horizontally polarized waves and is electrically connected to the doubler stage output by a flexible transmission line.

Power Supply: 1.5 volts, supplied by one Battery BA-35 (1.5 volts). 90 volts, supplied by two Batteries BA-36 (45 volts).

Frequency Range: 75 megacycles per second only.

Modulation Frequencies: 400, 1300 or 3000 cycles per second.

Type of Transmission: Amplitude Modulated Carrier.

Type of Reception: Continuous Wave.

Effective Range: 10 to 20 feet.

Field Strength: 900 microvolts per meter at 100 feet from test oscillator with antennas of oscillator and field strength meter parallel and mutually perpendicular to a line between center of antennas.

Accuracies: Over the temperature range of -26.1°C. to +55°C., the frequency drift with temperature is less than 150 cycles per second, ±2% variation in modulation frequency.

MANUFACTURERS' OR CONTRACTORS' DATA:

Packard Bell Company, 3443 Wilshire Boulevard, Los Angeles 5, California; Order No. 4099-DAY-45-CN, Approximate Cost per Unit, $136.47, 27 July 1945; Order No. 4027-DAY-45-SE, Approximate Cost per Unit, $136.85, 5 February 1945.

TUBE COMPLEMENT:

3 JAN-1A5GT, 1 JAN-1C5GT.

REFERENCE DATA AND LITERATURE:

TO 8-10-92.
TO 16-40BC376-2 (Maintenance Instructions).
TO 16-55-370 (Spare Parts List).
SB 11-100-69 (Serviceability Standards).

SHIPPING DATA:

No. of Boxes	Contents & Identification	Volume (Cu. Ft.)	Over-all Dimensions (inches)			Weight Packed (Lbs.)
			H	W	D	
1	Signal Generator, BC-376-H (Water Resistant Carton)	1.98	21	14	12	25

EQUIPMENT SUPPLIED:

Quant. Per Eq'pt	Name and Nomenclature	Case Mat'l	Stock Numbers (USAF) (Navy) (Army)	Over-all Dimensions (inches)			Weight (Lbs.)
				H	W	D	
1	Test Oscillator BC-376-H (Including Tubes)	Metal	7CAC-363929 ASO-R16-O-1800 3F3976H	13-3/4	8-9/16	7-3/4	17.75

TEST OSCILLATOR BC-376-J
(GENERATOR, SIGNAL, BC-376-J)

FUNCTIONAL DESCRIPTION:

A special purpose, portable unit used as a low power oscillator and heterodyne frequency meter in conjunction with Test Indicator BE-67 for adjustment of marker beacon receivers and transmitters.

RELATIONSHIP TO OTHER EQUIPMENT:

Used to test Radio Beacons such as AN/ARN-12.

Various production models differ in dimensions and weight. Models A, B, C, D, and E are similar electrically and mechanically. Models F and G are similar electrically and mechanically and are screen grid modulated while all other models are plate modulated. Model H is the lightest in weight and uses iron core slugs for tuning the modulator stage.

ELECTROMECHANICAL DESCRIPTION:

Circuit Information: A crystal oscillator, operating at 12.5 megacycles per second, is used to excite a frequency tripler stage which drives a final doubler stage.

(Continued)

	AIR FORCE	NAVY	ARMY
TYPE CLASS.	Limited Standard		
STOCK NOS.	1600-327298000		3F3976-J
PROCUREM'T INFO.:	Spec. MIL-T-4466 (USAF) dated 30 April 1952		
PROCUREM'T COG.:	USAF	DESIGN COG.:	USAF, C&N
F.I.I.N.:		FUNCTIONAL CLASS. NO.:	10.1.2
	- Electronics Test Equipment -		BC-376-J

This project was supported by the USAF on Contract AF 33(600)28276 and monitored by WADC, ARDC - Carl L. Frederick, Bethesda, Md. - Multilithed in U. S. A.

TEST OSCILLATOR BC-376-J
(GENERATOR, SIGNAL, BC-376-J)

ELECTROMECHANICAL DESCRIPTION: (Continued)

This provides a 75 megacycle radio frequency output that may be amplitude modulated, if desired, with audio frequency signals supplied by the modulator stage.

Antenna: The antenna is mounted horizontally so as to produce horizontally polarized waves and is electrically connected to the doubler stage output by a flexible transmission line.

Power Supply: 1.5 volts, supplied by one Battery BA-35 (1.5 volts). 90 volts, supplied by two Batteries, BA-36 (45 volts).

Frequency Range: 75 megacycles per second only.

Modulation Frequencies: 400, 1300, or 3000 cycles per second.

Type of Transmission: Amplitude Modulated Carrier.

Type of Reception: Continuous Wave.

Effective Range: 10 to 20 feet.

Field Strength: 900 microvolts per meter at 100 feet from test oscillator with antennas of oscillator and field strength meter parallel and mutually perpendicular to a line between centers of antennas.

Accuracies: Over the temperature range of -26.1°C. to +55°C., the frequency drift with temperature is less than 150 cycles per second, ±2% variation in modulation frequency.

MANUFACTURERS' OR CONTRACTORS' DATA:

Packard Bell Company, 3443 Wilshire Boulevard, Los Angeles 5, California; Approximate Cost per Unit, $200.00.

TUBE COMPLEMENT:

3 JAN-1A5GT, 1 JAN-1C5GT.

REFERENCE DATA AND LITERATURE:

TO 16-40BC376-2 (Maintenance Instructions).
TO 16-55-370 (Spare Parts List).
SB 11-100-69 (Serviceability Standards).

SHIPPING DATA:

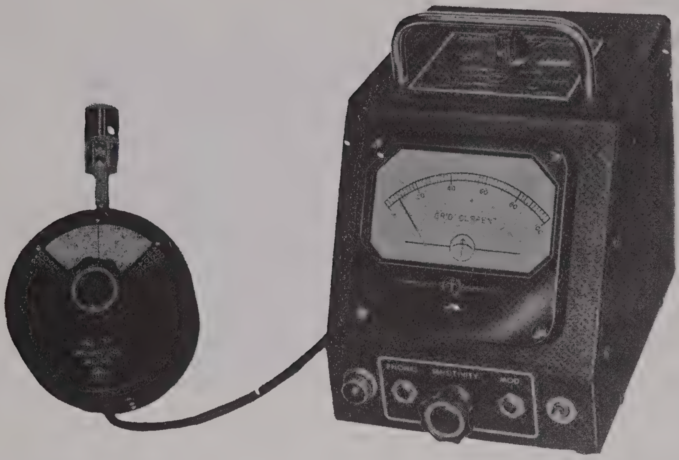
No. of Boxes	Contents & Identification	Volume (Cu. Ft.)	Over-all Dimensions (inches)			Weight Packed (Lbs.)
			H	W	D	
1	Test Oscillator, BC-376-J with accessories (Water Resistant Carton)	1.98	21	14	12	25

TEST OSCILLATOR BC-376-J
(GENERATOR, SIGNAL, BC-376-J)

EQUIPMENT SUPPLIED:

Quant. Per Eq'pt	Name and Nomenclature	Case Mat'l	Stock (USAF) Numbers (Navy) (Army)	Over-all Dimensions (inches)			Weight (Lbs.)
				H	W	D	
1	Test Oscillator BC-376-J (Including Tubes)	Metal	1600-327298000 3F3976J	12-5/16	9-3/16	7-3/4	21.5
1	Maintenance Instructions F/BC-376-H		3F3976H/B1				

MEGACYCLE METER FR-81/U



FUNCTIONAL DESCRIPTION:

A portable, general purpose grid-dip type oscillator used to determine the resonant frequency of tuned circuits in HF and VHF transmitters and receivers with the transmitter or receiver power off. The meter may be used as a variable frequency oscillator providing modulated or unmodulated signals for testing and aligning RF receivers and allied equipment. Other uses include measuring capacitance, inductance, mutual inductance, and Q. The meter may also be used as a low sensitivity receiver for signal tracing; as an oscillating or absorption marker; for locating parasitic circuits; for checking amplitude modulation; and keying of transmitters. Resonance effects are indicated by a meter which measures relative grid current. The output frequency dial is calibrated in megacycles.

RELATIONSHIP TO OTHER EQUIPMENT:

The FR-81/U can be used as an interim for AN/PRM-10.

	AIR FORCE	NAVY	ARMY
TYPE CLASS.			
STOCK NOS.			
PROCUREM'T INFO.:			
PROCUREM'T COG.: Navy		DESIGN COG.: Navy	
F. I. I. N.:		FUNCTIONAL CLASS. NO.: 10. 1. 2	
	- Electronics Test Equipment -		FR-81/U

MEGACYCLE METER FR-81/U

ELECTROMECHANICAL DESCRIPTION:

Circuit Information: The circuit consists of an oscillator and a tuned circuit coil mounted externally so that it will be convenient for coupling to other circuits. A DC microammeter and headphone jacks are in series with the grid leak. A switch is provided to remove the plate voltage from the oscillator tube, changing the tube from a triode oscillator to a diode detector. Seven plug-in coils are provided to obtain the desired frequency range.

Power Supply: 110 to 120 volts, AC, 50 to 60 cycles per second, single-phase, 20 watts.

Frequency Range: 2.2 to 400 megacycles per second.

Type of Transmission: CW or MCW.

Amplitude Modulation: 120 cycles per second internally. Provisions are made for external modulation. Output is fixed at approximately 30% of CW.

Frequency Accuracy: Individually calibrated dial, direct reading to an accuracy of ±2%.

MANUFACTURERS' OR CONTRACTORS' DATA:

Measurements Corporation, Boonton, New Jersey; Approximate Cost per Unit, $168.00.

TUBE COMPLEMENT:

1 955, 1 OD3/VR150, 1 5Y3GT.

REFERENCE DATA AND LITERATURE

Measurements Corp. Catalog "Laboratory Standards."

EQUIPMENT SUPPLIED:

Quant. Per Eq'pt	Name and Nomenclature	Case Mat'l	Stock Numbers (USAF) (Navy) (Army)	Overall Dimensions (inches) H	W	D	Weight (Lbs.)
1	Megacycle Meter, FR-81/U	metal		5-5/8	7-13/16	8-3/8	6-1/2
1	Oscillator Unit			3-3/4 dia. x 2			1

SHIPPING DATA:

No. of Boxes	Contents & Identification	Volume (Cu. Ft.)	Overall Dimensions (inches) H	W	D	Weight Packed (Lbs.)
1	Megacycle Meter, FR-81/U	0.53	10	13	7	11

TEST UNIT I-86-A

FUNCTIONAL DESCRIPTION:

A portable, signal generator and beat frequency meter used for accurate checking and aligning of high frequency circuits of certain types of recognition transmitters or receivers. All operating controls are located on the front panel. A green pilot lamp is provided to indicate when power is turned on and a phone jack is provided so that head phones can be connected for test purposes when operating as a heterodyne frequency meter.

RELATIONSHIP TO OTHER EQUIPMENT:

ELECTROMECHANICAL DESCRIPTION:

Power Supply: 115 volts, AC, 60 cycles per second, single phase, 25 watts.
Frequency Range: Output 470 megacycles per second (oscillator).
Input 470 megacycles per second (frequency meter).

(Continued)

	AIR FORCE	NAVY	ARMY
TYPE CLASS.			
STOCK NOS.	1690-327788000		3F4086A
PROCUREM'T INFO.: G. E. Co. No. BRD-65B			
PROCUREM'T COG.: USAF	DESIGN COG.: USAF, C&N		
F.I.I.N.:	FUNCTIONAL CLASS. NO.: 10. 1. 2		

This project was supported by the USAF on Contract AF 33(600)28276 and monitored by WADC, ARDC - Carl L. Frederick, Bethesda, Md. - Multilithed in U. S. A.

TEST UNIT I-86-A

ELECTROMECHANICAL DESCRIPTION: (Continued)

Input 493.5 megacycles per second (frequency meter).
Type of Transmission: Amplitude Modulated Carrier
Modulation: 30 kilocycles per second.
Accuracy: ±5 megacycles per second as a frequency meter.

MANUFACTURERS' OR CONTRACTORS' DATA:

General Electric Company, Bridgeport, Connecticut; Order No. 635-WFSCPD-42; Approximate Cost per Unit, $1169.88.

TUBE COMPLEMENT:

2 JAN-956, 2 JAN-955, 1 JAN-7C6, 3 JAN-7A4, 1 JAN-84.

REFERENCE DATA AND LITERATURE:

Instruction Book for Radio Test Unit I-86-A.

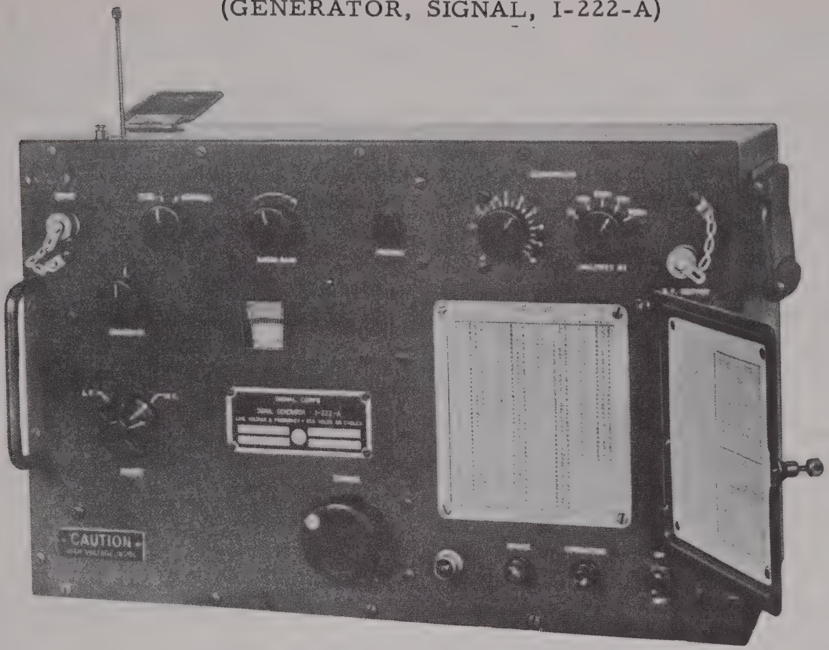
SHIPPING DATA:

No. of Boxes	Contents & Identification	Volume (Cu. Ft.)	Overall Dimensions (inches)			Weight Packed (Lbs.)
			H	W	D	

EQUIPMENT SUPPLIED:

Quant. Per Eq'pt	Name and Nomenclature	Case Mat'l	Stock Numbers (USAF) (Navy) (Army)	Overall Dimensions (inches)			Weight (Lbs.)
				H	W	D	
1	Test Unit I-86-A	Metal	1690-327788000 3F4086A	9-3/4	18	11-3/4	
1	Antenna Rod, Quarter Wave			9 long			
1	Coupling Cable, Radio Frequency			42-3/4 long			
1	Power Cord 2 Wire, Rubber Covered			78 long			
						Total:	25.75

SIGNAL GENERATOR I-222-A
(GENERATOR, SIGNAL, I-222-A)



FUNCTIONAL DESCRIPTION:

A portable, general purpose, combination signal generator and heterodyne type wavemeter used to provide an accurate and reliable method of checking the frequency output of transmitters and for aligning receivers. Output signal frequency and voltage are directly indicated on calibrated dials located on the operating panel. All controls, switches, and a chart giving calibration points are mounted on the front panel.

RELATIONSHIP TO OTHER EQUIPMENT:

ELECTROMECHANICAL DESCRIPTION:

Circuit Information: A 5-megacycle, crystal controlled, self-excited oscillator is used as a frequency standard calibrator. The second and third harmonics are used on low range calibration and the 9th to 15th on high range calibration. A variable, two range, test oscillator utilizing a modified Hartley circuit provides

(Continued)

	AIR FORCE	NAVY	ARMY
TYPE CLASS.			
STOCK NOS.	7CAC-363899		3F3900-222A
PROCUREM'T INFO.:	Dwg. No. 205-680		
PROCUREM'T COG.:	Army	DESIGN COG.:	Army, CSL
F.I.I.N.:		FUNCTIONAL CLASS. NO.:	10.1.2
	- Electronics Test Equipment -		I-222-A

his project was supported by the USAF on Contract AF 33(600)28276 and monitored by WADC, ARDC - Carl L. Frederick, Bethesda, Md. - Multilithed in U. S. A.

SIGNAL GENERATOR I-222-A
(GENERATOR, SIGNAL, I-222-A)

ELECTROMECHANICAL DESCRIPTION: (Continued)

the radio frequency signal. A turret, having both a high and low frequency coil, rotates as the switch marked "Range" is turned to either the high frequency or low frequency position, thus placing the desired coil in operation. The output of the test oscillator is coupled to the detector. The detector output passes through two stages of audio amplification to the phone jack. A heterodyne or audio signal is obtained by coupling either the output of the crystal oscillator (when calibrating) or an external signal picked up by the antenna, to the detector circuit simultaneously with the test oscillator signal. The difference in frequency of the two signals produces a beat note that is audible in the headphones and can be used to adjust the test oscillator frequency until the two frequencies are equal.

Power Supply: 118 volts, AC, 60 cycles per second, single phase, 40 watts.

Frequency Range: 8 to 15 megacycles per second. 135 to 230 megacycles per second.

Type of Transmission: Continuous Wave.

Type of Reception: Continuous Wave.

Output Signal Voltage Range: 0 to 100,000 microvolts.

Output Impedance: 100 ohms with multiplier in position 7.
50 ohms with multiplier in position 8.
5 ohms with multiplier in position 9, 10, 11.

Crystal Controlled Oscillator Fundamental Frequency: 5 megacycles per second.

MANUFACTURERS' OR CONTRACTORS' DATA:

Espey Manufacturing Company, Inc., 528 East 72nd Street, New York, New York; Order No. 1872-MPD-44.

TUBE COMPLEMENT:

1 JAN-6J5, 2 JAN-6SJ7, 1 JAN-5Y3G, 1 JAN-9002, 1 JAN-9006.

REFERENCE DATA AND LITERATURE:

TO 16-40I222-8 (TM 11-1082) (Instruction Book).
TO 16-55-330 (Spare Parts List).

SHIPPING DATA:

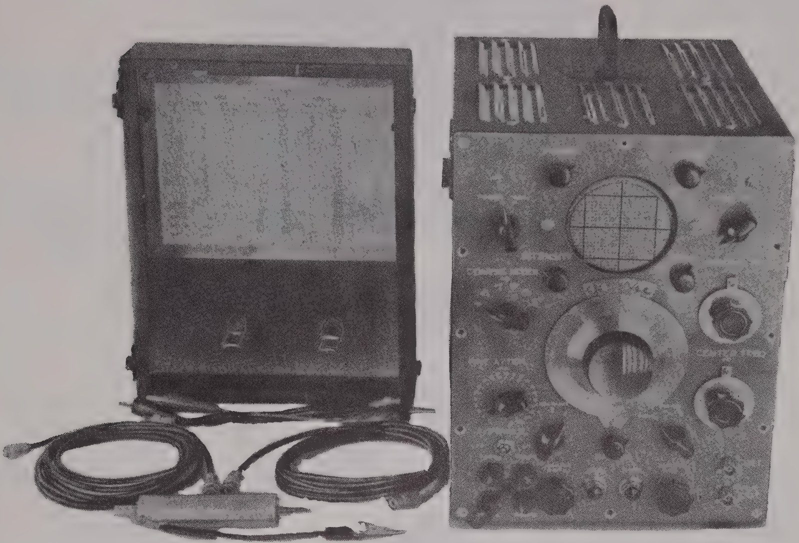
No. of Boxes	Contents & Identification	Volume (Cu. Ft.)	Over-all Dimensions (inches)			Weight Packed (Lbs.)
			H	W	D	
1	Signal Generator, I-222-A (Shelf Package - Water Resistant Carton)	3	24	18	12	78

SIGNAL GENERATOR I-222-A
(GENERATOR, SIGNAL, I-222-A)

EQUIPMENT SUPPLIED:

Quant. Per Eq'pt	Name and Nomenclature	Case Mat'l	Stock Numbers (USAF) (Navy) (Army)	Over-all Dimensions (inches)			Weight (Lbs.)
				H	W	D	
1	Signal Generator I-222-A less accessories		7CAC-363899 3F3900-222A	19-1/2	12	7-1/2	
1	Power Cord		1800-322851125 3E7144-5	96 long			
1	RF Cable CD-1104		1800-322014133 3E1999-104	60 long			
1	IF Cable CD-1103		1800-322014132 3E1999-103	33 long			
1	Phone Cord CD-1141		1800-322014163 3E1999-141	60 long			
1	Antenna			10-3/4 (max.)			
1	Set of Headphones						
						Total:	50

RF SIGNAL GENERATOR SG-27(XW)/U



UNCTIONAL DESCRIPTION:

A Loran Wobulator for use in visually displaying the band pass of any electronic ircuit with band pass characteristics 1000 cycles per second to 50 kilocycles wide perating in the frequency range 20 to 220 kilocycles. Contains calibrated wavemeter, calibrated attenuator, probe detector, and cathode ray indicator.

ELATIONSHIP TO OTHER EQUIPMENT:

LECTROMECHANICAL DESCRIPTION:

requency Range: 20 to 220 kilocycles.
requency Deviation: 0 to ±35 kilocycles.
ccuracy: ±5% of indicated frequency.
±10% of indicated deviation.
avemeter: Relative ±0.5% or ±100 cycles per second, whichever is greater, absolute ±1%.

(Continued)

	AIR FORCE	NAVY	ARMY
TYPE CLASS.			
STOCK NOS.			
PROCUREM'T INFO.: USAF Exhibit WLENG-1213, 7 Apr 1949, Spec. No. 40952-A			
PROCUREM'T COG.: USAF		DESIGN COG.: USAF, Rome	
F.I.I.N.:		FUNCTIONAL CLASS. NO.: 10.1.2	
- Electronics Test Equipment -			SG-27(XW)/U

is project was supported by the USAF on Contract AF 33(600)28276 and monitored by WADC, ARDC - Carl L. Frederick, Bethesda, Md. - Multilithed in U. S. A.

RF SIGNAL GENERATOR SG-27(XW)/U

ELECTROMECHANICAL DESCRIPTION: (Continued)
Output Impedance: 50 ±25 ohms.
Voltage Output: 0.3 volts rms minimum over entire frequency range.
Type of Transmission: Frequency Modulated Carrier.

MANUFACTURERS' OR CONTRACTORS' DATA:

Television Equipment Corporation, New York, New York; Contract No. AF 28 (099)100; Cost of experimental model, $11,350.00; Cost of preproduction model, $5,490.00, June 1949.

TUBE COMPLEMENT:

2 JAN-6AS6, 3 JAN-6AG5, 6 JAN-12AU7, 1 JAN-OA2, 1 JAN-3RP1-A, 1 JAN-544G, 2 JAN-6AH6, 1 JAN-6AQ5, 2 JAN-6J6, 1 JAN-6AL5, 1 JAN-1Z2.

REFERENCE DATA AND LITERATURE:

Interim Engineering Report, Television Equipment Corporation.

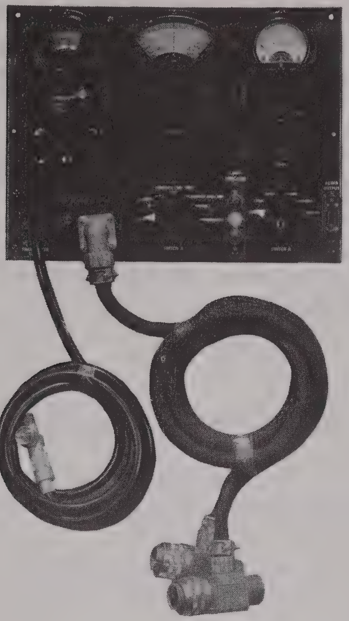
SHIPPING DATA:

No. of Boxes	Contents & Identification	Volume (Cu. Ft.)	Overall Dimensions (inches)			Weight Packed (Lbs.)
			H	W	D	

EQUIPMENT SUPPLIED:

Quant. Per Eq'pt	Name and Nomenclature	Case Mat'l	Stock Numbers (USAF) (Navy) (Army)	Overall Dimensions (inches)			Weight (Lbs.)
				H	W	D	
1	Signal Generator SG-27(XW)/U			12-1/4	9-1/2	14-1/4	35
2	Cable, RG-58/U with UG-88/U Plug on each end		8860-324000-211 1F425-58	72 long			
2	Adapter UG-255/U		8850-108880 2Z308-255				
2	Adapter UG-88/U w/6" hook-up wire & 2 alligator clips		8850-468450 2Z7390-88				

TEST SET TS-16/APN
(TEST SET, RADAR, TS-16/APN)



FUNCTIONAL DESCRIPTION:

A portable and self-contained test unit designed for use by depots when checking altimeter counter and indicator circuits, modulation sweep-frequency, and transmitter frequency swing. Rotary-switch dial positions indicate delay periods in feet. Frequency is read directly in megacycles from a rotary dial. A meter is provided for checking line voltage.

RELATIONSHIP TO OTHER EQUIPMENT:

Test Set TS-16X/APN and TS-16/APN are similar except that the power supply circuits are designed to operate on direct current supplies of 27 volts (nominal 24 volts) and 13.5 volts (nominal 12 volts) respectively.

The TS-16/APN was formerly called IE-34.

ELECTROMECHANICAL DESCRIPTION:

Power Supply: 1.4 amperes at 27 to 28 volts, direct current, obtained from equipment under test.

(Continued)

	AIR FORCE	NAVY	ARMY
TYPE CLASS.	Substitute Standard		
STOCK NOS.	7CAC-801319-2162		3F4325-16
PROCUREM'T INFO.:	Army Spec. No. 271-1714 A & Amendment No. 3		
PROCUREM'T COG.:	USAF	DESIGN COG.: USAF, ARL	
F.I.I.N.:		FUNCTIONAL CLASS. NO.: 10.1.2	
	- Electronics Test Equipment -		TS-16/APN

his project was supported by the USAF on Contract AF 33(600)28276 and monitored by WADC, ARDC - Carl L. Frederick, Bethesda, Md. - Multilithed in U. S. A.

TEST SET TS-16/APN
(TEST SET, RADAR, TS-16/APN)

ELECTROMECHANICAL DESCRIPTION: (Continued)

Frequency Range, Input: 410 to 470 megacycles per second.
Frequency Range, Output: 978.5 to 6650 cycles per second.
Accuracy: Error not to exceed ±0.3 megacycles per second (±0.07%).
Audio-Oscillator Range: 351 to 6935 cycles per second (not continuous).
Audio Accuracy: ±1% up to 5000 cycles per second; ±2% from 5000 to 6935 cycles per second; ±1.5% on 50 ft. range; ±1% on other ranges.
Modulator-Frequency Accuracy: ±0.5 cycles per second from 117 to 123 cycles per second; ±1% of the indicated frequency 340 to 5000 cycles per second; ±2% of the indicated frequency from 5000 to 7250 cycles per second.
Input Impedance: Audio Circuit - high. Radio Frequency Circuit - 50 ohms.
Output Impedance: 15,000 ohms.
Accuracy of Counter Circuit: 1% or better.
Temperature Range: -40° C. to +55° C.
Humidity Range: Up to 95%.
Barometric Pressure Range: 20 to 30 inches of mercury.

MANUFACTURERS' OR CONTRACTORS' DATA:

RCA Victor Division, Camden, New Jersey; Approximate Cost per Unit, $366.00; Order Nos. 249-DAY-44 and 10105-WF-43.

Electronics Corporation of America, 45 West 18th Street, New York, New York; Order No. 2003-DAY-45-RA, 30 January 1945; Approximate Cost per Unit, $366.00.

TUBE COMPLEMENT:

1 JAN-9002, 2 JAN-12SJ7, 1 JAN-12A6, 2 JAN-12J5GT.

REFERENCE DATA AND LITERATURE:

AN 08-35TS16-2 (Operating Instructions).
TO 16-35TS-16-3 (Maintenance Instructions).
TO 16-55-115 (Spare Parts List).

SHIPPING DATA:

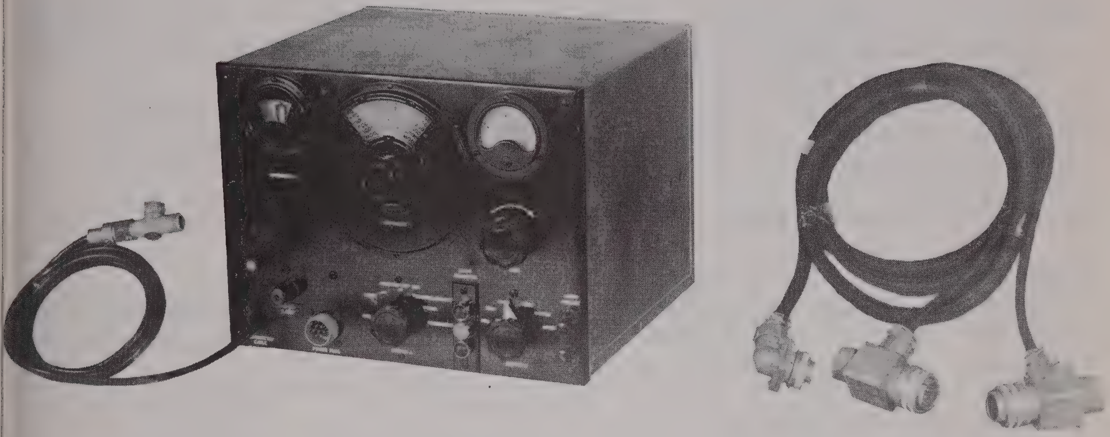
No. of Boxes	Contents & Identification	Volume (Cu. Ft.)	Over-all Dimensions (inches)			Weight Packed (Lbs.)
			H	W	D	
1	Test Set TS-16/APN with accessories (Packed VPP, MFD)	4.7	21	16	25.5	95

TEST SET TS-16/APN
(TEST SET, RADAR, TS-16/APN)

EQUIPMENT SUPPLIED:

Quant. Per Eq'pt	Name and Nomenclature	Case Mat'l	Stock Numbers (USAF) (Navy) (Army)	Over-all Dimensions (inches)			Weight (Lbs.)
				H	W	D	
1	Test Set TS-16/APN (Complete)		7CAC-801319-2162 3F4325-16	10-3/4	14-1/8	17-1/4	40.000
1	Case with shock mounts						
1	Vibrator VB-14		3300-371696970 3HK6714				
1	Cord CX-35/APN		7CAC-170270-1373 3EK6035	96 long			2.250
1	Phantom Antenna Unit TS-63/AP		7CAC-274432 3FK4325-63	1-1/2	3/4		0.125
1	Instruction Book, AN 08-35TS16-2						

TEST SET TS-16X/APN
(TEST SET, RADAR, TS-16X/APN)



FUNCTIONAL DESCRIPTION:

A portable and self-contained test unit designed for use by depots when checking altimeter counter and indicator circuits, modulation sweep-frequency, and transmitter frequency swing. Rotary-switch dial positions indicate delay periods in feet. Frequency is read directly in megacycles from a rotary dial. A meter is provided for checking line voltage.

RELATIONSHIP TO OTHER EQUIPMENT:

Test Sets TS-16X/APN and TS-16/APN are similar except that the power supply circuits are designed to operate on direct current supplies of 27 volts (nominal 24 volts) and 13.5 volts (nominal 12 volts) respectively.

ELECTROMECHANICAL DESCRIPTION:

Power Supply: 12 to 14 volts direct current.
Frequency Range, Input: 410 to 470 megacycles per second.

(Continued)

	AIR FORCE	NAVY	ARMY
TYPE CLASS.	Limited Standard		
STOCK NOS.	7CAC-801319-216		3F4325-16X
PROCUREM'T INFO.: USAF Spec. No. 371-1714			
PROCUREM'T COG.: USAF		DESIGN COG.: USAF, ARL	
F.I.I.N.:		FUNCTIONAL CLASS. NO.: 10.1.2	
- Electronics Test Equipment -			TS-16X/APN

This project was supported by the USAF on Contract AF 33(600)28276 and monitored by WADC, ARDC - Carl L. Frederick, Bethesda, Md. - Multilithed in U. S. A.

TEST SET TS-16X/APN
(TEST SET, RADAR, TS-16X/APN)

ELECTROMECHANICAL DESCRIPTION: (Continued)

Accuracy: Error not to exceed ±0.3 megacycles per second (±0.07%).

Audio-Oscillator Range: 351 to 6840 cycles per second (not continuous).

Audio Accuracy: 1% up to 5000 cycles per second; 2% from 5000 to 6840 cycles per second.

Modulator-Frequency Accuracy: ±0.5 cycles per second from 117 to 123 cycles per second; 1% of indicated frequency 340 to 5000 cycles per second; 2% of indicated frequency 5000 to 7250 cycles per second.

Input Impedance: Audio Circuit - high. Radio Frequency Circuit - 50 ohms.

Output Impedance: 15,000 ohms and 500 ohms.

Temperature Range: -22° F. to +120° F.

Humidity Range: Up to 95%.

Barometric Pressure Range: 20 to 30 inches of mercury.

MANUFACTURERS' OR CONTRACTORS' DATA:

Electronics Corporation of America, 353 West 48th Street, New York, New York, Order No. 249-DAY-44 and 10105-WF-43, 5 April 1943; Order No. 455-DAY-45, 19 October 1944, Approximate Cost per Unit, $366.00.

TUBE COMPLEMENT:

1 JAN-9002, 2 JAN-12SJ7, 1 JAN-12A6, 2 JAN-12J5GT.

REFERENCE DATA AND LITERATURE:

AN 16-35TS16-3 (Maintenance Instructions).

TO 16-55-115 (Spare Parts List).

SHIPPING DATA:

No. of Boxes	Contents & Identification	Volume (Cu. Ft.)	Over-all Dimensions (inches)			Weight Packed (Lbs.)
			H	W	D	
1	Test Set TS-16X/APN (Shelf Package - Water Resistant Carton)	4.7	16	21	25.5	95

TEST SET TS-16X/APN
(TEST SET, RADAR, TS-16X/APN)

EQUIPMENT SUPPLIED:

Quant. Per Eq'pt	Name and Nomenclature	Case Mat'l	Stock Numbers (USAF) (Navy) (Army)	Over-all Dimensions (inches)			Weight (Lbs.)
				H	W	D	
1	Test Set TS-16X/APN (Complete)		7CAC-801319-216 3F4325-16X	10-3/4	14-1/8	17-1/4	40
1	Case with shock mounts						
1	Vibrator VB-14		3300-371696970 3H6690-11				
1	Cord CX-35/APN		7CAC-170270-1373 3EK6035	96 long			2.25
1	Phantom Antenna Unit TS-63/AP		7CAC-274432 2A2725-63	1-1/2	3/4		0.125
1	Instruction Book AN 16-35TS16-3						

TEST SET TS-233/TPN-2

FUNCTIONAL DESCRIPTION:

A portable, special purpose set, used by all maintenance echelons in testing a beacon transmitter-receiver. It consists of a crystal controlled harmonic signal generator, a heterodyne type wavemeter calibrated with a self-contained crystal oscillator, and a built-in high voltage power supply. The test set is used as a wavemeter to check the transmitter frequency, and as a signal generator to check the receiver frequency. Five crystals (1N21B) are used in this set, one crystal for calibrating in each of the five channels in which the beacon operates. All controls and indicators are located on the front panel of the set. The telescoping antenna extends through an opening in the top of the case. A power cord connects to a twist-lock plug at the rear of the case.

RELATIONSHIP TO OTHER EQUIPMENT:

This set is used in testing Beacon Transmitter Receiver AN/TPN-2.

	AIR FORCE	NAVY	ARMY
TYPE CLASS.	Standard		
STOCK NOS.	7CAC-801315-42		3F4325-233
PROCUREM'T INFO.: Spec. No. R-7412			
PROCUREM'T COG.: Army		DESIGN COG.: Army, ESL	
F.I.I.N.:		FUNCTIONAL CLASS. NO.: 10.1.2	
- Electronics Test Equipment -			TS-233/TPN-2

This project was supported by the USAF on Contract AF 33(600)28276 and monitored by WADC, ARDC - Carl L. Frederick, Bethesda, Md. - Multilithed in U. S. A.

TEST SET TS-233/TPN-2

ELECTROMECHANICAL DESCRIPTION:

Circuit Information: The test set consists of a crystal oscillator (Pierce oscillator circuit), a detector-mixer (untuned, non-linear), a variable frequency oscillator (modified Hartley oscillator; cathode grounded through choke coils instead of returning to the tank coil), two stages of audio-amplification, and a high voltage power supply (full-wave rectifier, regulated to 210 volts, DC).

As a wavemeter: The variable oscillator signal is heterodyned with the incoming signal from the antenna, which is a series of radio frequency pulses. The beat not at the mixer output consists of pulses at the same recurrence rate as the incoming radio frequency signal. The beat heard at the headphones is a minimum when the incoming signal is at the same frequency as the varaible oscillator, making alignment possible.

As a signal generator: The variable oscillator signal is radiated from the antenna and received by the beacon receiver. This radiated signal provides a standard signal in adjusting the receiver tuning.

Power Supply: 115 volts, AC, 60 cycles per second, single phase, 50 watts, derived from the receiver-transmitter component of the beacon or from a separate source.

Frequency Range: 200 to 250 megacycles per second.

Testing Frequencies: 214, 219, 224, 229, 234 megacycles per second. Any frequencies between these points may be found by interpolation.

Channel	Fundamental Crystal Frequency (kc/s)	32 Harmonic (mc/s)
A	6,687.5	214
B	6,843.75	219
C	7,000.0	224
D	7,156.25	229
E	7,312.5	234

Type of Transmission: Continuous Wave.

Type of Reception: Pulsed.

RF Power Output: 4.5 milliwatts (to beacon receiver).

Input Impedance: Telescopic Rod Antenna (15" extended, 5" collapsed).

Output Impedance: Telescopic Rod Antenna (RF), also a video output to the test headset.

Distance from Antenna to Beacon: 20 feet, normal. 50 feet, maximum.

Accuracy: ±0.02% (±70 kilocycles per second) of indicated frequency at beacon channel frequencies.
±0.1% at all other frequencies.

Temperature Range: -40° C. to +65.5° C., operating.

MANUFACTURERS' OR CONTRACTORS' DATA:

Fada Radio and Electric Company, Inc., Long Island City, New York; Army Contract No. W-28-004-sc-208; Approximate Cost per Unit, $76.00, 1944.

TUBE COMPLEMENT:

2 JAN-OC3/VR-105, 1 JAN-5Y3GT, 1 JAN-6AK5, 1 JAN-6C4, 1 JAN-6J6, 1 JAN-9002.

TEST SET TS-233/TPN-2

REFERENCE DATA AND LITERATURE:

TO 16-55-327 (Spare Parts List).

TM 11-1157 (Operating and Maintenance Instructions for AN/TPN-2).

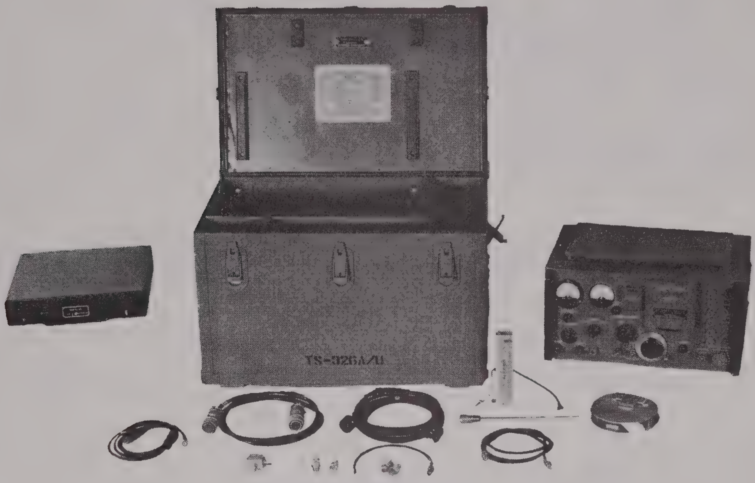
SHIPPING DATA:

No. of Boxes	Contents & Identification	Volume (Cu. Ft.)	Overall Dimensions (inches)			Weight Packed (Lbs.)
			H	W	D	

EQUIPMENT SUPPLIED:

Quant. Per Eq'pt	Name and Nomenclature	Case Mat'l	Stock Numbers (USAF) (Navy) (Army)	Overall Dimensions (inches)			Weight (Lbs.)
				H	W	D	
1	Test Set TS-233/TPN-2 Including:	Aluminum	7CAC-801315-42 3F4325-233	10-5/8	6-5/32	7-1/2	25
1	Cord CX-296/TPN-2		1800-322975186 3E6000-296	72 long			
1	Cord CD-605 (for headset)		1800-321630000 3E1605-6.5				
1	Headset HS-30/U		1700-207595300 2B830U				

TEST OSCILLATOR TS-326A/U
(GENERATOR, SIGNAL, TS-326A/U)



FUNCTIONAL DESCRIPTION:

A portable combination test equipment used either as a radio frequency signal generator or a crystal controlled heterodyne frequency meter. It is used to test radio control receivers for organization, field, and depot maintenance. Radio frequency output is directly calibrated in microvolts. Provisions are made for internal or external modulation. All controls and indicators are located on the front panel.

RELATIONSHIP TO OTHER EQUIPMENT:

ELECTROMECHANICAL DESCRIPTION:

Power Supply: 115 volts ±10%, AC, single phase, 50 to 1600 cycles per second.
Frequency Range: 50 to 100 megacycles per second.
Type of Transmission: Amplitude Modulated.
Modulation: Internal: 300, 475, 755, 1195, 1900, and 3000 cycles per second.

(Continued)

	AIR FORCE	NAVY	ARMY
TYPE CLASS.	Limited Standard		
STOCK NOS.	7CAC-363923		3F4325-326A
PROCUREM'T INFO.:	USAF Exhibit No. 437A		
PROCUREM'T COG.:	USAF	DESIGN COG.:	USAF, ARL
F.I.I.N.:		FUNCTIONAL CLASS. NO.:	10.1.2
	- Electronics Test Equipment -		TS-326A/U

This project was supported by the USAF on Contract AF 33(600)28276 and monitored by WADC, ARDC - Carl L. Frederick, Bethesda, Md. - Multilithed in U. S. A.

TEST OSCILLATOR TS-326A/U
(GENERATOR, SIGNAL, TS-326A/U)

ELECTROMECHANICAL DESCRIPTION: (Continued)

Modulation: External: 100 to 10,000 cycles per second; 0 to 100% indicated by modulation meter.

Voltage Output Range: 1 to 150,000 microvolts from "Microvolts" jack. 0.1 to 1.0 volt from "Volts-Frequency Meter" jack.

RF Output Impedance: 50 ohms.

AF Output Impedance: 600 ohms.

Accuracy: ±0.25 megacycles per second after thirty minute warm-up; ±10% modulation indication; ±15% voltage indication.

Temperature Range: -40° C. to $+55^{\circ}$ C.

MANUFACTURERS' OR CONTRACTORS' DATA:

RCA Victor Division, Camden, New Jersey; Contract No. W-33-038-ac-6682; Approximate Cost per Unit, $2000.00.

TUBE COMPLEMENT:

3 JAN-OA2, 1 JAN-5R4GY, 8 JAN-6J6, 1 JAN-5750, 2 JAN-5814.

REFERENCE DATA AND LITERATURE:

TO 16-35TS326-6 (Operating Instructions).
TO 16-35TS326-7 (Maintenance Instructions).
TO 16-35TS326-8 (Parts Catalog).
TO 16-35TS326-11 (Operating Instructions).
TO 16-35TS326-12 (Service Instructions).
TO 16-35TS326-13 (Overhaul Instructions).
TO 16-35TS326-14 (Parts Breakdown).

SHIPPING DATA:

No. of Boxes	Contents & Identification	Volume (Cu. Ft.)	Over-all Dimensions (inches)			Weight Packed (Lbs.)
			H	W	D	
TS-326A/U	- Electronics Test Equipment -					

TEST OSCILLATOR TS-326A/U
(GENERATOR, SIGNAL, TS-326A/U)

EQUIPMENT SUPPLIED:

Quant. Per Eq'pt	Name and Nomenclature	Case Mat'l	Stock Numbers (USAF) (Navy) (Army)	Over-all Dimensions (inches)			Weight (Lbs.)
				H	W	D	
1	Test Oscillator, TS-326A/U		7CAC-363923 3F4325-326A	9-1/2	17-3/8	12-3/4	60.5
1	Case CY-341/U		7CAC-176572-49 2Z1891-341	15	25-1/2	16	42.5
1	Crystal Case and Crystal CS-151		1600-286764508 2Z1890-151	2-1/2	12	12-1/2	8.5
1	Cord CX-237/U		7CAC-170264-495 3E6000-237-120	120 long			
1	Cord CG-409A/U		7CAC-170265-56515 3E6015-409A-58	60 long			
1	Cable CX-1138/U			60 long			
1	RF Cable Assembly CG-521/U						
1	Coupling Head CU-80/U		7CAC-225550				
1	Antenna AT-188/U		7CAC-045785 2A203-188				
1	Antenna AT-122/U		7CAC-045685 2A203-122				
2	Adapter (N to BNC) UG-201/U		8850-101950 2Z308-201				
2	Adapter (UHF to BNC) UG-273/U		8850-102000 2Z308-273				
8	Fuse (Spare) 2 amperes 3, AG						
5	Pilot Lamp (Spare) GE Mazda 47						

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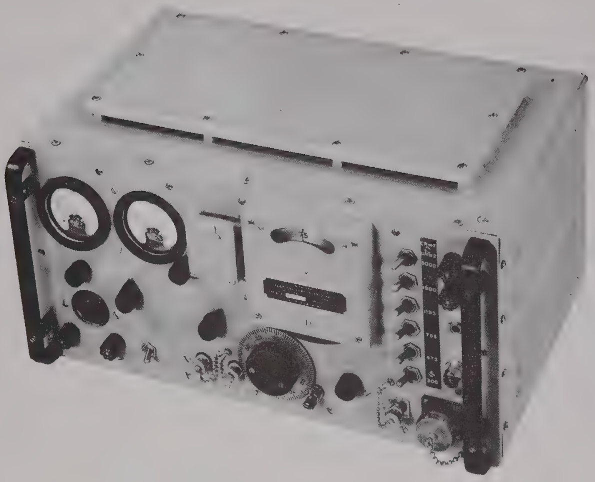
TEST OSCILLATOR TS-326B/U



FUNCTIONAL DESCRIPTION:

A portable general purpose combination test equipment used either as a radio frequency signal generator or a crystal controlled heterodyne frequency meter. It is used to test radio control receiving and transmitting sets. Radio frequency output is directly calibrated in microvolts. Frequency is calibrated in megacycles per second. Provisions are made for internal or external modulation. Percent modulation is also indicated directly. This equipment is used in organizational, field, and depot testing.

RELATIONSHIP TO OTHER EQUIPMENT:

ELECTROMECHANICAL DESCRIPTION:

Circuit Information: As a signal generator this set consists of an RF Hartley type oscillator followed by two multiplier stages and an output stage. Two audio (Continued)

	AIR FORCE	NAVY	ARMY
TYPE CLASS.	Standard		
STOCK NOS.	7CAC-364320		3F4325-326B
PROCUREM'T INFO.: Spec. MIL-T-4406 dated 25 February 1952			
PROCUREM'T COG.: USAF		DESIGN COG.: USAF, ARL	
F.I.I.N.:		FUNCTIONAL CLASS. NO.: 10.1.2	

This project was supported by the USAF on Contract AF 33(600)28276 and monitored by WADC, ARDC - Carl L. Frederick, Bethesda, Md. - Multilithed in U. S. A.

TEST OSCILLATOR TS-326B/U

ELECTROMECHANICAL DESCRIPTION: (Continued)

oscillators provide means for internal amplitude modulation of nine discrete audio tones.

The frequency meter employs the use of a mixer and detector to supply the difference frequency between its crystal oscillator and the tuned oscillator. There are 47 different crystals which plug into the front panel ranging in frequency between 3 and 6 megacycles per second for use with the frequency meter. No retuning of the tuned oscillator is necessary for any of these plug-in crystals.

The output meter is of the RF crystal detector type. The modulation indicator reads audio modulation voltage, but is calibrated in percent.

Power Supply: 105 to 125 volts, AC, 50 to 1000 cycles per second, single-phase, approximately 1.5 amperes.

Frequency Range: 50 to 100 megacycles per second.

Type of Transmission: Amplitude Modulated.

Modulation Frequency: 300, 475, 650, 755, 955, 1195, 1390, 1900, and 3000 cycles per second, internal; 100 to 10,000 cycles per second, external.

Percent Modulation: 0 to 90%.

Signal Output Range: 1 to 100,000 microvolts; 0.1 to 1.0 volt.

Audio Output: 20 milliwatts, maximum, into 8 to 600 ohms.

Output Impedance: 50 ohms.

Accuracy: ±0.25 megacycle per second of frequency indication after 30-minute warmup; ±10% of modulation indication; ±15% of voltage indication.

Temperature Range: -40°C. (-40°F.) to +55°C. (+131°F.) operational; -55°C. (-67°F.) to +85°C. (+185°F.) nonoperational.

MANUFACTURERS' OR CONTRACTORS' DATA:

Stone and Smith Company, Los Angeles, California; Contract No. AF 33(600)-21259; Approximate Cost per Unit, $2100.00.

TUBE COMPLEMENT:

3 JAN-OA2, 1 JAN-5R4WGY, 7 JAN-6101/6J6WA, 3 JAN-5814WA, 1 JAN-5726/6AL5W/6097, 1 JAN-5654/6AK5W/6096.

REFERENCE DATA AND LITERATURE:

Manufacturer's Instruction Book.

TEST OSCILLATOR TS-326B/U

SHIPPING DATA:

No. of Boxes	Contents & Identification	Volume (Cu. Ft.)	Overall Dimensions (inches)			Weight Packed (Lbs.)
			H	W	D	

EQUIPMENT SUPPLIED:

Quant. Per Eq'pt	Name and Nomenclature	Case Mat'l	Stock Numbers (USAF) (Navy) (Army)	Overall Dimensions (inches)			Weight (Lbs.)
				H	W	D	
1	Test Oscillator TS-326B/U		7CAC-364320 3F4325-326B	18-1/2	17	12-1/2	60.0
1	Case CY-341/U		7CAC-176572-49 2Z1891-341	15-1/2	23-1/2	15-1/2	30.0
1	Coupling Head CU-80/U		7CAC-225550 2Z745-80				
1	Antenna AT-122/U		7CAC-045865 2A203-122				
1	Antenna AT-188/U		7CAC-045785 2A203-188				
1	Case CS-151 including crystals, cables, adapters, and spare parts		1600-286764508 2Z1890-151	2-1/2	12	12-1/2	8.5
1	Cord CX-337/U		7CAC-170264-86	120 long			
1	Cord CG-409A/U		7CAC-170265-565 3E6015-409A60	60 long			

(Continued)

TEST OSCILLATOR TS-326B/U

EQUIPMENT SUPPLIED: (Continued)

Quant. Per Eq'pt	Name and Nomenclature	Case Mat'l	Stock Numbers (USAF) (Navy) (Army)	Over-all Dimensions (inches)			Weight (Lbs.)
				H	W	D	
1	RF Cable Assembly CG-521/U			60 long			
2	Adapter (N to BNC) UG-201/U		8850-101950 2Z308-201	1-5/16	3/4 dia.		
2	Adapter (UHF to BNC) UG-273/U		8850-102000 2Z308-273				
8	Fuse (Spare) 2 amperes, 3 AG		8800-360982				
5	Pilot Lamp (Spare) G. E. Mazda 47		8800-444163				
1	Special Purpose Cable Assembly CX-1253/U			60 long			
						Total:	100

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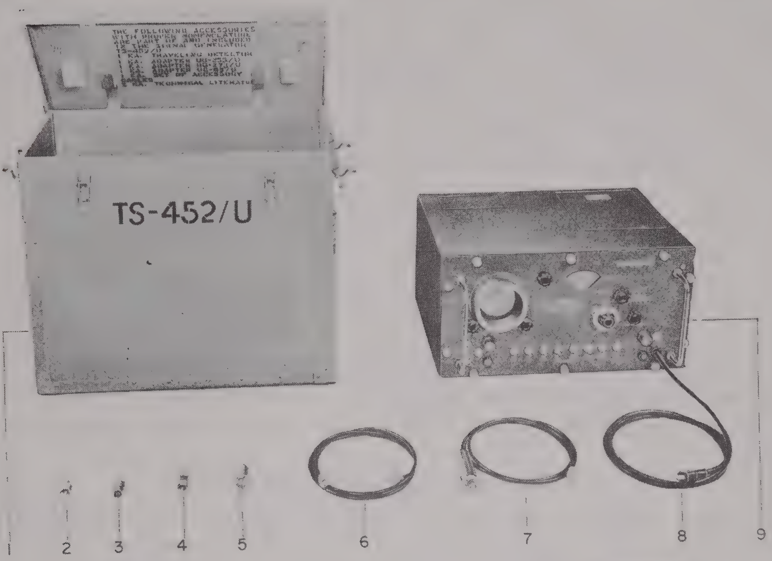
SIGNAL GENERATOR TS-452/U
(GENERATOR, SIGNAL, TS-452/U)



1. Transit Case.
2. Adapter UG-273/U
3. Adapter UG-255/U
4. Adapter UG-83
5. Terminating Resistor
6. Output Cable
7. Traveling Detector (Probe)
8. Power Cable
9. Signal Generator

FUNCTIONAL DESCRIPTION:

A portable instrument used to test alignment of intermediate frequency and radio frequency circuits. Used for the maintenance of equipment or as a laboratory instrument for experimental or production testing. Band pass characteristic curves are plotted electronically on the screen of a cathode ray tube for a particular network.

RELATIONSHIP TO OTHER EQUIPMENT:

TS-452/U, TS-452A/U, and TS-452B/U are similar except that the location and labeling of the controls differ and the range of frequency modulation is slightly different for each model.

ELECTROMECHANICAL DESCRIPTION:

Circuit Information: A wobulated radio frequency signal, generated by the instrument, is applied to an unknown network under test. A traveling detector picks up this signal from any desired point in the unknown network and rectifies it.

(Continued)

	AIR FORCE	NAVY	ARMY
TYPE CLASS.			
STOCK NOS.	7CAC-363896	ASO-R16-AN-TS-452/U	3F3901-452
PROCUREM'T INFO. : Exhibit No. WLENG-133A, 21 June 1948; USAF Spec. No. 7519			
PROCUREM'T COG. : USAF	DESIGN COG. : USAF, Rome		
F.I.I.N. :	FUNCTIONAL CLASS. NO. : 10.1.2		
- Electronics Test Equipment -			TS-452/U

is project was supported by the USAF on Contract AF 33(600)28276 and monitored by WADC, ARDC - Carl L. Frederick, Bethesda, Md. - Multilithed in U. S. A.

SIGNAL GENERATOR TS-452/U
(GENERATOR, SIGNAL, TS-452/U)

ELECTROMECHANICAL DESCRIPTION: (Continued)

This rectified signal is then amplified and applied to the vertical plates of a cathode ray tube. The time interval of the horizontal sweep of the oscilloscope is synchronized with the variations from minimum to maximum frequency of the signal generated. The spot on the screen is then caused to travel across the screen horizontally from left to right once during the time the frequency changes from minimum to maximum. The resulting pattern on the oscilloscope screen provides an indication of the voltage (vertical deflection) of the signal received from the network for each frequency (horizontal deflection) of the signal.

Wobulator: The frequency is varied by a motor-driven capacitor over a selected range at a rate of 60 to 120 times per second. In order to provide an "X" axis corresponding to frequency, a sweep generator is also driven by the same capacitor motor.

Wavemeter: An absorption type wavemeter is provided to cause a blank section in the oscilloscope track and thus accurately locate frequency points.

Power Supply: 115 volts, AC, 50 to 1600 cycles per second, single phase, 120 watts approximately.

Type of Transmission: Frequency Modulated Carrier.

Frequency Range: Signal Generator, 5 to 100 megacycles per second in six bands. Wavemeter, 5 to 100 megacycles per second in four bands.

Input Amplifier Response: 20 to 30,000 cycles per second (flat).

Voltage Output: 0.25 volts (minimum).

Input Impedance: 2.5 micromicrofarads shunted by 470 ohms.

Output Impedance: 75 ohms.

Accuracy of Wavemeter: ±0.33% of indicated frequency.

Step-type Attenuator: 101 decibels in attenuator steps 1, 2, 3, 5, 10, 20, 20, 40 decibels.

MANUFACTURERS' OR CONTRACTORS' DATA:

Thermionic Engineering Corporation, Rt. 23 and Boulevard, Pompton Plains, New Jersey; Production Contract No. AF-33-038-ac-19129; Approximate Cost per Unit, $1000.00, December 1947.

Development Contract No. W33-038-ac-19129; dated 1945.

Reiner Electronics Company, 152 W. 25th Street, New York, New York; Contract No. W28-099-ac-39.

Lewyt Corporation, 60 Broadway, Brooklyn 11, New York; W-33-038 AF-428, 9 November 1948; Approximate Cost per Unit, $394.00.

TUBE COMPLEMENT:

3 JAN-6SN7-GT, 1 JAN-6AQ6, 2 JAN-6X5GT/G, 2 JAN-OD3/VR150, 1 JAN-3BP1-A, 2 JAN-6SL7-GT, 1 JAN-6J6.

REFERENCE DATA AND LITERATURE:

TO 16-35TS452-3 (Maintenance Instructions).

SIGNAL GENERATOR TS-452/U
(GENERATOR, SIGNAL, TS-452/U)

SHIPPING DATA:

No. of Boxes	Contents & Identification	Volume (Cu. Ft.)	Overall Dimensions (inches)			Weight Packed (Lbs.)
			H	W	D	
1	Signal Generator, TS-452/U and equipment supplied (Shelf-Packed)					

EQUIPMENT SUPPLIED:

Quant. Per Eq'pt	Name and Nomenclature	Case Mat'l	Stock Numbers (USAF) (Navy) (Army)	Overall Dimensions (inches)			Weight (Lbs.)
				H	W	D	
1	Signal Generator TS-452/U	Metal	7CAC-363896 R16-AN-TS-452/U 3F3901-452	16	19	9-3/4	55.0
1	Traveling Detector and Cable			60 long	1-1/4 dia.		0.45
1	Adapter UG-83/U		8850-108745 17C-67991-3690 2Z308-83	1-5/8 long	3/4 dia.		0.10
1	Adapter UG-255/U		8850-108880 17C-67989-1323 2Z308-255	1-3/8 long	5/8 dia.		0.10
1	Adapter UG-273/U		8850-102000 17C-67988-5260 2Z308-273	1-3/8 long	3/4 dia.		0.10
1	Output Cable			60 long	9/16 dia.		0.25
1	Terminating Resistor			2-1/2 long	1 dia.		0.20
1	Transit Case			19	23	13-7/8	18.0
						Total:	74.20

SIGNAL GENERATOR TS-452A/U

751-S
VERTICAL INPUT

FUNCTIONAL DESCRIPTION:

A portable instrument used to test alignment of intermediate frequency and radio frequency circuits. Used for the maintenance of equipment or as a laboratory instrument for experimental or production testing. Band pass characteristic curves are plotted electronically on the screen of a cathode ray tube for a particular network.

RELATIONSHIP TO OTHER EQUIPMENT:

Functionally the TS-452/U, TS-452A/U, and TS-452B/U are similar. Location and labeling of controls and indicators in the models differ; however, the same number and means of controls are employed.

Total 101 decibels 452 internal attenuators of 1, 2, 3, 5, 10, 20, 20, 40.

Total 101 decibels 452A internal attenuators of 1, 2, 3, 5, 10, 20, 20, 20, 20.

Total 101 decibels 452B internal attenuators of 1, 2, 3, 5, 10, 20, 30, 30.

The TS-452/U was an experimental model that went into production somewhat prematurely. Contracts were let to three different contractors and sufficient differences in appearance, construction, and circuits arose to require different nomenclature for each version.

(Continued)

	AIR FORCE	NAVY	ARMY
TYPE CLASS.	Substitute Standard		
STOCK NOS.	7CAC-801319-266		3F3901-452A
PROCUREM'T INFO.:	Exhibit BNG-2115A		
PROCUREM'T COG.:	USAF	DESIGN COG.:	USAF, Rome
F.I.I.N.:		FUNCTIONAL CLASS. NO.:	10.1.2
	- Electronics Test Equipment -		TS-452A/U

is project was supported by the USAF on Contract AF 33(600)28276 and monitored by WADC, ARDC - Carl L. Frederick, Bethesda, Md. - Multilithed in U. S. A.

SIGNAL GENERATOR TS-452A/U

ELECTROMECHANICAL DESCRIPTION: (Continued)

Power Supply: 115 volts ±10%, AC, single phase, 50 to 1600 cycles per second, 92 watts approximately.

Frequency Range: 5 to 100 megacycles per second in six bands, output.
5 to 102 megacycles per second in four bands, frequency meter.

Signal Generator:	Coil	Frequency Swing
	501	5 to 10 megacycles per second
	502	8 to 15 megacycles per second
	503	12 to 24 megacycles per second
	504	19 to 39 megacycles per second
	505	30 to 60 megacycles per second
	506	47 to 100 megacycles per second

Wavemeter:	Band	Frequency
	A	5 & 10 megacycles per second
	B	10 & 21 megacycles per second
	C	21 & 45 megacycles per second
	D	46 & 102 megacycles per second

Radio Frequency Voltage Output: 0.25 volts minimum over entire frequency range.

Type of Transmission: Frequency Modulated.

Output Impedance: 73 ohms.

Input Impedance: 2.5 microfarads shunted by 470 ohms.

Attenuator Steps: 1, 2, 3, 5, 10, 20, 20, 20, 20 decibels.

Operating Temperature Range: -40° C. to +65° C.

Accuracy:

Wavemeter: ±0.33%, readable frequency accuracy on scope image ±0.75% of the frequency.

Attenuators:	Frequency	Frequency
Step	5 to 75 mc	75 to 100 mc
1, 2, 3, 5 decibels	±0.5 decibel	±0.5 decibel
10 decibels	±0.1 decibel	±0.1 decibel
20 decibels	±0.1 decibel	±1.5 decibels

Recalibrations of Wavemeter: Using a signal generator calibrated against a crystal frequency source, the wavemeter can be recalibrated per instructions in AN 16-35TS-452-11 by adjustment of the wavemeter trimmers.

Wavemeter Calibration: Use standard Signal Generator TS-452A/U and trim wavemeter.

Linearity: The radio frequency output voltage is constant to within ±10% measured at the image on the scope based on a one-inch vertical image. This includes non-linearities encountered in the amplifier, traveling detector, etc., as well as the output voltage non-linearity.

Harmonic Content: At least 26 decibels below this fundamental frequency except for the second harmonic of the fundamental frequencies 5 through 50 megacycles which are at least 20 decibels down.

(Continued)

SIGNAL GENERATOR TS-452A/U

MANUFACTURERS' OR CONTRACTORS' DATA:

Fairchild Camera and Instrument Corporation, 88-06 Van Wyck Boulevard, Jamaica, New York; Contract No. W33(308)ac21185; 18 May 1948, Approximate Cost per Unit, $533.00.

Lewyt Corporation, 60 Broadway, Brooklyn 11, New York; Contract No. AF 428, 10 December 1948; Approximate Cost per Unit, $394.00; Contract No. AF 34455, 13 April 1949; Approximate Cost per Unit, $477.00; Contract No. AF 14247, 26 June 1950; Approximate Cost per Unit, $468.00.

TUBE COMPLEMENT:

3 JAN-6SN7GT, 1 JAN-6AQ6, 2 JAN-6X5GT/G, 2 JAN-OD3/VR150, 1 JAN-3BP1-A, 2 JAN-6SL7GT, 1 JAN-6J6, 2 JAN-1N43 or 1N69 (Germanium Crystals).

REFERENCE DATA AND LITERATURE:

TO 16-35TS452-7 (Maintenance Instructions).
TO 16-35TS452-8 (Parts Catalog).
TO 16-35TS452-10 (Operation and Service Instructions).
TO 16-35TS452-11 (Handbook of Maintenance Instructions).
TO 16-35TS452-12 (Parts Catalog).

SHIPPING DATA:

No. of Boxes	Contents & Identification	Volume (Cu. Ft.)	Overall Dimensions (inches)			Weight Packed (Lbs.)
			H	W	D	

EQUIPMENT SUPPLIED:

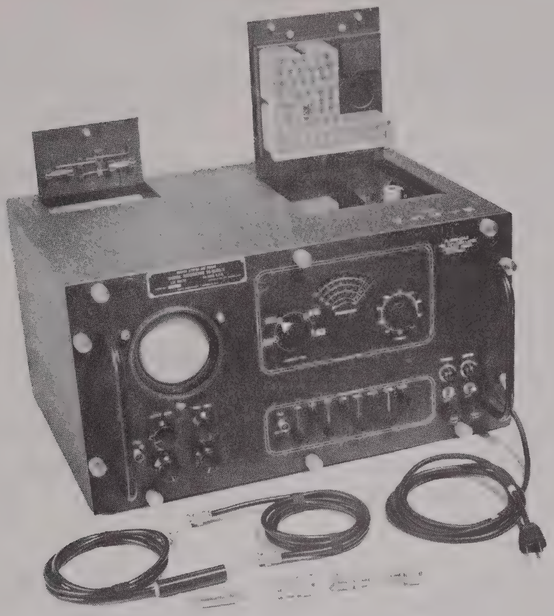
Quant. Per Eq'pt	Name and Nomenclature	Case Mat'l	Stock Numbers (USAF) (Navy) (Army)	Overall Dimensions (inches)			Weight (Lbs.)
				H	W	D	
1	Signal Generator TS-452A/U	Metal	7CAC-801319-266 3F3901-452A	19	16	9-7/8	62.0
1	Transit Case			22-1/4	18-5/8	12-5/16	30.0
1	Load Adapter UG-83/U		8850-108745 17C-67991-3690 2Z308-83	1-5/8 long	3/4 dia.		0.10
1	Load Adapter UG-255/U		8850-108880 17C-67989-1323 2Z308-255	1-3/8 long	5/8 dia.		0.10

(Continued)

EQUIPMENT SUPPLIED: (Continued)

Quant. Per Eq'pt	Name and Nomenclature	Case Mat'l	Stock Numbers (USAF) (Navy) (Army)	Over-all Dimensions (inches)			Weight (Lbs.)
				H	W	D	
1	Load Adapter UG-273/U		8850-102000 17C-67988-5260 2Z308-273	1-3/8 long	3/4 dia.		0.10
1	Radio Frequency Output Cable			60 long	9/16 dia.		0.25
1	Load Terminal			2-1/4	9/16		0.10
1	Traveling Detector			4-1/4 long	1 dia.		0.45
1	Cable UG-260/U (attached to traveling detector)		8850-469685	49 long	5/16 dia.		

SIGNAL GENERATOR TS-452B/U



FUNCTIONAL DESCRIPTION:

A portable, general purpose, combination signal generator and wavemeter used in the test alignment of intermediate frequency and radio frequency circuits. Used for the maintenance of equipment or as a laboratory instrument for experimental or production testing. Band pass characteristic curves are plotted electronically on the screen of a cathode ray tube for a particular network.

RELATIONSHIP TO OTHER EQUIPMENT:

Functionally the TS-452/U, TS-452A/U, and TS-452B/U are similar. Location and labeling of controls and indicators in the models differ; however, the same number and means of controls are employed.

ELECTROMECHANICAL DESCRIPTION:

Circuit Information: The signal generator is a wobulator type; the frequency is varied by a motor-driven capacitor over a selected range of 60 to 120 cycles per

(Continued)

	AIR FORCE	NAVY	ARMY
TYPE CLASS.	Standard		
STOCK NOS.	7CAC-363895		3F4325-452B
PROCUREM'T INFO.: Eng-2115; WLENG 133A			
PROCUREM'T COG.: USAF		DESIGN COG.: USAF, Rome	
F.I.I.N.:		FUNCTIONAL CLASS. NO.: 10.1.2	
- Electronics Test Equipment -			TS-452B/U

This project was supported by the USAF on Contract AF 33(600)28276 and monitored by WADC, ARDC - Carl L. Frederick, Bethesda, Md. - Multilithed in U. S. A.

SIGNAL GENERATOR TS-452B/U

ELECTROMECHANICAL DESCRIPTION: (Continued)

second. In order to provide a time base corresponding to frequency, a sweep generator is also driven by the same capacitor motor.

The wavemeter is an absorption type; a blank section in the oscilloscope track accurately locates frequency points.

Power Supply: 115 volts ±10%, AC, single phase, 50 to 1600 cycles per second, 125 watts, approximately.

Frequency Range:

Signal Generator: 5 to 100 megacycles per second in six bands: 5 to 10, 8 to 15, 12 to 24, 19 to 39, 30 to 60, 47 to 100 megacycles per second.

Wavemeter: 5 to 100 megacycles per second in four bands: 5 to 10, 10 to 20, 20 to 40, and 40 to 100 megacycles per second.

Type of Transmission: Frequency Modulated.

Radio Frequency Voltage Output: 0.25 volt minimum over frequency.

Output Impedance: 73 ohms.

Input Impedance: 2.5 microfarads shunted by 470 ohms.

Attenuator Steps: 1, 2, 3, 5, 10, 20, 30, 30.

Linearity: The radio frequency output voltage is constant to within ±10% measured at the image on the scope based on a one-inch vertical image. This includes non-linearities encountered in the amplifier, traveling detector, etc., as well as the output voltage non-linearity.

Accuracy:

Wavemeter Recalibrations: Wavemeter to be replaced with a new factory calibrated wavemeter obtained from supply.

Wavemeter: ±0.33%. Readable frequency accuracy on scope image ±0.75% of frequency.

Attenuator: ±0.2 decibel for attenuator steps 1, 2, 3 decibels.
±0.25 decibel for attenuator step 5 decibels.
±0.5 decibel for attenuator step 10 decibels.
±1.0 decibel for attenuator step 20 decibels.
±1.5 decibels for attenuator step 30 decibels.

Harmonic Content: At least 26 decibels below the fundamental frequency except for the second harmonic of the fundamental frequency, 5 through 50 megacycles per second which are at least 20 decibels down.

MANUFACTURERS' OR CONTRACTORS' DATA:

Lewyt Corporation, 60 Broadway, Brooklyn 11, New York; Contract No. 33(038) 6165, 21 December 1949; Approximate Cost per Unit, $468.00; Lewyt Corporation No. PO-33(038)50-4618, 26 June 1950; Approximate Cost per Unit, $468.00; Lewyt Corporation Contract No. AF 33(038)12239, 26 April 1950; Approximate Cost per Unit, $419.00.

TUBE COMPLEMENT:

3 JAN-6SN7-GT, 1 JAN-6AQ6, 2 JAN-6X5GT/G, 2 JAN-OD3/VR-150, 1 JAN-3BD1-A, 2 JAN-6SL7-GT, 1 JAN-6J6, 2 JAN-1N43 (Germanium Crystals).

REFERENCE DATA AND LITERATURE:

TO 16-35TS452-7 (Maintenance Instructions).
TO 16-35TS452-8 (Parts Catalog).

SIGNAL GENERATOR TS-452B/U

SHIPPING DATA:

No. of Boxes	Contents & Identification	Volume (Cu. Ft.)	Overall Dimensions (inches)			Weight Packed (Lbs.)
			H	W	D	
1	Signal Generator, TS-452B/U (Export Package)	7.1	29	23-1/4	18	138

EQUIPMENT SUPPLIED:

Quant. Per Eq'pt	Name and Nomenclature	Case Mat'l	Stock Numbers (USAF) (Navy) (Army)	Overall Dimensions (inches)			Weight (Lbs.)
				H	W	D	
1	Signal Generator TS-452B/U	Metal	7CAC-363895 3F4325-452B	19	16	9-3/4	59.50
1	Transit Case			23	19	13-7/8	31.50
1	Adapter UG-255/U		8850-108880 N17-C-67989-1323 2Z308-255	1-3/8 long	5/8 dia.		0.10
1	Adapter UG-273/U		8850-102000 N17-C-67988-5260 2Z308-273	1-3/8 long	3/4 dia.		0.10
1	Adapter UG-83/U		8850-108745 N17-C-67991-3690 2Z308-83	1-5/8 long	3/4 dia.		0.10
1	Traveling Detector			4 long	5/8 dia.		0.45
1	Output Cable RF			60 long	9/16 dia.		0.25
1	Load Termination				2-1/4	9/16	0.10
1	Cable			49 long	5/6 dia.		

SIGNAL GENERATOR TS-452C/U

FUNCTIONAL DESCRIPTION:

A portable, general purpose, combination signal generator and wavemeter used to check the alignment of intermediate frequency and radio frequency circuits. It is used for the maintenance of equipment, as a laboratory instrument for experimental work, and for production testing. Band-pass characteristic curves are plotted electronically on the screen of a cathode ray tube for a particular network.

RELATIONSHIP TO OTHER EQUIPMENT:

Functionally the TS-452/U, TS-452A/U, TS-452B/U and TS-452C/U are similar. Location and labeling of controls and indicators in the models differ; however, the same number and means of controls are employed.

ELECTROMECHANICAL DESCRIPTION:

Circuit Information: The signal generator is a wobulator type; the frequency is varied by a motor-driven capacitor over a selected range of 60 to 120 cycles per

(Continued)

	AIR FORCE	NAVY	ARMY
TYPE CLASS.	Standard		
STOCK NOS.	7CAC-363895-2		3F4325-452C
PROCUREM'T INFO.: Exhibit ENG-367; Spec. MIL-S-4933 (USAF)			
PROCUREM'T COG.: USAF		DESIGN COG.: USAF, Rome	
F.I.I.N.:		FUNCTIONAL CLASS. NO.: 10.1.2	
	- Electronics Test Equipment -		TS-452C/U

his project was supported by the USAF on Contract AF 33(600)28276 and monitored by WADC, ARDC - Carl L. Frederick, Bethesda, Md. - Multilithed in U. S. A.

SIGNAL GENERATOR TS-452C/U

ELECTROMECHANICAL DESCRIPTION: (Continued)

second. In order to provide a time base corresponding to frequency, a sweep generator is also driven by the same capacitor motor.

The wavemeter is an absorption type; a blank section in the oscilloscope track accurately locates frequency points.

Power Supply: 115 volts ±10%, AC, single phase, 50 to 1600 cycles per second, 125 watts approximately.

Frequency Range:

Signal Generator: 5 to 100 megacycles per second in six bands: 5 to 10, 8 to 15, 12 to 24, 19 to 39, 30 to 60, 47 to 100 megacycles per second.

Wavemeter: 5 to 100 megacycles per second in four bands: 5 to 10, 10 to 20, 20 to 40, and 40 to 100 megacycles per second.

Vertical Amplifier Flat Frequency Response: 20 to 30,000 cycles per second.

Type of Transmission: Frequency Modulated.

Oscillator RF Output Voltage: 0.25 volt minimum into matched load, and constant within ±5% over each frequency range.

Output Impedance: 75 ohms ±2%.

Input Impedance of Probe: 2.5 micromicrofarads shunted by 470 ohms.

Attenuator Steps: 1, 2, 3, 5, 10, 20, 30, 30 (101 decibels in 1 decibel steps).

Oscillator RF Output Hum Modulation: ±2% maximum.

Accuracy:

Wavemeter: ±0.33%. Readable frequency accuracy on scope image ±0.5% of frequency.

Attenuator: ±0.2 decibel for attenuator steps 1, 2, 3 decibels.
±0.25 decibel for attenuator steps 5 decibels.
±0.5 decibel for attenuator step 10 decibels.
±1.0 decibel for attenuator step 20 decibels.
±1.5 decibels for attenuator step 30 decibels.

Harmonic Content: No harmonic will have an amplitude greater than 5% that of the fundamental frequency.

MANUFACTURERS' OR CONTRACTORS' DATA:

Lewyt Manufacturing Corporation, 60 Broadway, Brooklyn 11, New York; Contract No. AF 33(604)8704, dated June 1953, and AF 33(604)9317, dated April 1954; Approximate Cost per Unit, $506.00.

TUBE COMPLEMENT:

3 JAN-6SN7GT, 1 JAN-6AQ6, 2 JAN-6X5GT, 2 JAN-OD3/VR-150, 1 JAN-3BP1-A, 2 JAN-6SL7GT, 1 JAN-6J6, 1 JAN-1B3GT.

REFERENCE DATA AND LITERATURE:

33A1-8-90-2 (Maintenance Instructions).
33A1-8-90-4 (Parts Catalog).

SIGNAL GENERATOR TS-452C/U

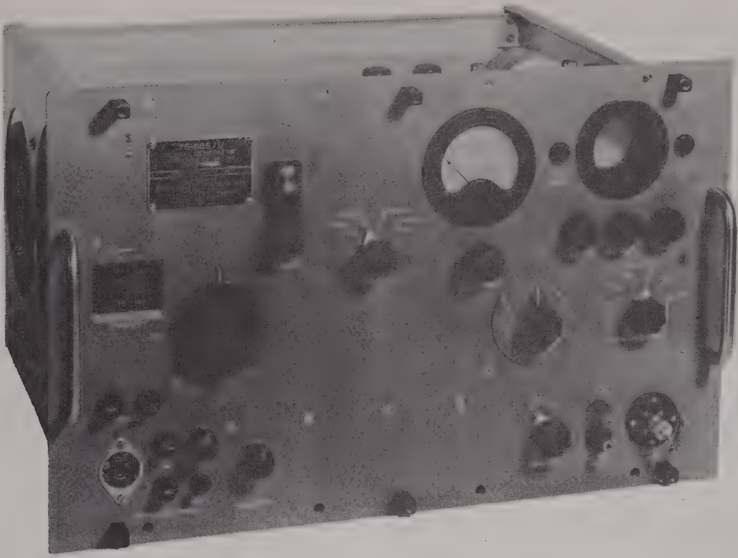
SHIPPING DATA:

No. of Boxes	Contents & Identification	Volume (Cu. Ft.)	Overall Dimensions (inches)			Weight Packed (Lbs.)
			H	W	D	
1	Signal Generator TS-452C/U (Export Packed)	7.1	29	23-1/4	18	138

EQUIPMENT SUPPLIED:

Quant. Per Eq'pt	Name and Nomenclature	Case Mat'l	Stock Numbers (USAF) (Navy) (Army)	Overall Dimensions (inches)			Weight (Lbs.)
				H	W	D	
1	Signal Generator TS-452C/U	Metal	7CAC-363895-2 3F4325-452C	19	16	9-3/4	55.0
1	Transit Case			23	19	13-7/8	18.0
1	Adapter UG-255/U		8850-108880 N17-C-67989-1323 2Z308-255	1-3/8 long	5/8 dia.		0.10
1	Adapter UG-273/U		8850-102000 N17-C-67988-5260 2Z308-273	1-3/8 long	3/4 dia.		0.10
1	Adapter UG-83/U		8850-108745 N17-C-67991-3690 2Z308-83	1-5/8 long	3/4 dia.		0.10
1	Traveling Detector			60 long	1-1/4 dia.		0.45
1	Output Cable RF			60 long	9/16 dia.		0.25
1	Terminating Resistor			2-1/2	1 dia.		0.20
1	Calibrated Scale				3-3/16 dia.		

SIGNAL GENERATOR TS-535/U



UNCTIONAL DESCRIPTION:

A portable, general purpose test instrument designed to generate sine wave volt-ages of known frequency at known amplitudes in the upper audio and supersonic bands. Amplitude Modulation is obtained either internally or from an external source. The arrier frequency dial is calibrated in kilocycles per second; a calibration book is sed to find the exact dial reading corresponding to the chosen carrier frequency. The carrier can be calibrated against an internal calibrator oscillator at special heck points by comparing the two sine waves on an internal cathode ray tube oscil-oscope. In addition to internal calibration, the oscilloscope, in conjunction with he internal calibrator, can be used as a frequency meter for measurement of an xternal signal. The output from the internal calibrator can be used independently s a test signal. Standard output level (1 volt) is calibrated and measured by means f the "Carrier Adjust" knob and the carrier meter indicator. From then on it is ttenuated by either or both of a "microvolt-decibel" control and a five-section lad-der "Multiplier."

	AIR FORCE	NAVY	ARMY
TYPE CLASS.			
STOCK NOS.		F16-G-62502-2193	
PROCUREM'T INFO.: Spec. RE-13A-935A (Ships)			
PROCUREM'T COG.: Navy		DESIGN COG.: Navy, BuShips	
F.I.I.N.:		FUNCTIONAL CLASS. NO.: 10.1.2	
- Electronics Test Equipment -			TS-535/U

s project was supported by the USAF on Contract AF 33(600)28276 and monitored by WADC, ARDC - Carl L. Frederick, Bethesda, Md. - Multilithed in U. S. A.

SIGNAL GENERATOR TS-535/U

RELATIONSHIP TO OTHER EQUIPMENT:

ELECTROMECHANICAL DESCRIPTION:

Power Supply: 115 volts ±10 volts, AC, 50 to 63 cycles per second, single phase, 185 watts.

Frequency Range: 7 to 160 kilocycles per second in four bands.

Frequency of Internal Calibrator: 5 kilocycles per second.

Type of Transmission: Continuous Wave or Amplitude Modulated.

Output Voltage: 0.5 microvolt to 1 volt (-6 decibels to +120 decibels for reference level at 1 microvolt).

Output Impedance: 5 ohms.

Modulation Frequencies:

Internal: 30% at 400 cycles per second.

External: 30% between 20 and 2000 cycles per second, 1 volt applied.

Accuracy:

Carrier Frequency: ±0.1% below 70 kilocycles per second (specification), ±0.5% above 70 kilocycles per second (specification), ±0.03% (measured).

Calibrator Frequency: ±0.01% after warm-up.

Output Voltage: ±10%, or 1.0 microvolt, below 70 kilocycles per second; ±10%, or 0.5 microvolt, above 70 kilocycles per second.

MANUFACTURERS' OR CONTRACTORS' DATA:

Hewlett-Packard Company, Palo Alto, California; Contract Nos. NXsr-84980, dated 8 December 1944; NObsr-39384, dated 28 June 1947.

TUBE COMPLEMENT:

2 JAN-6SJ7, 2 JAN-6V6GT/G, 1 JAN-6AG7, 1 JAN-6SA7, 3 JAN-6SN7W, 1 JAN-5U4G, 1 JAN-OC3/VR-105, 1 JAN-6SQ7, 2 JAN-6L6GA, 1 JAN-6J5, 1 JAN-6H6, 1 JAN-2AP1.

REFERENCE DATA AND LITERATURE:

NavShips 900,839 (Instruction Book).

SHIPPING DATA:

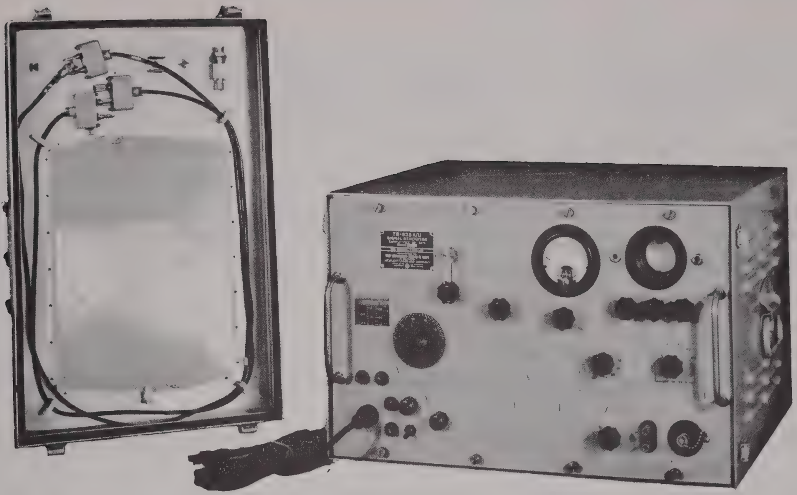
No. of Boxes	Contents & Identification	Volume (Cu. Ft.)	Over-all Dimensions (inches)			Weight Packed (Lbs.)
			H	W	D	
1	Signal Generator TS-535/U	9.1	21	30	25	180
1	Set of Equipment Spare Parts	2.0	10-1/2	22	14-1/2	61

SIGNAL GENERATOR TS-535/U

EQUIPMENT SUPPLIED:

Quant. Per Eq'pt	Name and Nomenclature	Case Mat'l	Stock Numbers (USAF) (Navy) (Army)	Over-all Dimensions (inches)			Weight (Lbs.)
				H	W	D	
1	Signal Generator TS-535/U	Metal	F16-G-62502-2193	14	21-11/16	17-7/8	86.0000
1	External Attenuator CN-77/U			3/4	3/4	2-1/4	0.1250
1	Output Cable CG-409/U			50 long			0.2500
1	Output Cable CG-465/U			51 long			0.5000
1	Output Cable CG-466/U			53 long			0.5000
1	Adapter UG-201/U		8850-101950	3/4	3/4	1-13/32	1.0625
1	Power Cable CAQI-62391			87 long			0.3750
2	Instruction Book NavShips 900839			11-1/2	9	1/4	0.7500
1	Calibration Book			11-1/2	9	1/4	0.2500

SIGNAL GENERATOR TS-535A/U



FUNCTIONAL DESCRIPTION:

A portable general purpose test instrument designed to generate sine wave voltages of known frequencies and amplitudes in the upper audio and supersonic bands. Amplitude modulation is obtained either internally or from an external source. The carrier frequency dial is calibrated in kilocycles per second and the carrier frequency output is further controlled by a 100 division vernier knob. A calibration book is provided to allow for the selection of carrier frequencies with the greatest accuracy of which the signal generator is capable. The carrier can be calibrated against an internal calibrator oscillator at special check points by comparing the two sine waves on the self-contained cathode ray tube oscilloscope. In addition to internal calibration, the oscilloscope, in conjunction with the internal calibrator, can be used as a frequency meter for measurement of an external signal. The output from the internal calibrator can be used independently as a test signal. The standard output level (1 volt) is calibrated and measured by means of the "Carrier Adjust" knob and the carrier meter indicator. It is then attenuated by a two-section attenuator. The first section of the attenuator is continuously variable while the second varies in 20 decibel steps.

	AIR FORCE	NAVY	ARMY
TYPE CLASS.			
STOCK NOS.			
PROCUREM'T INFO.: Spec. MIL-S-15961 (Ships)			
PROCUREM'T COG.: USN	DESIGN COG.: USN, BuShips		
F.I.I.N.:	FUNCTIONAL CLASS. NO.: 10.1.2		
- Electronics Test Equipment -			TS-535A/U

This project was supported by the USAF on Contract AF 33(600)28276 and monitored by WADC, ARDC - Carl L. Frederick, Bethesda, Md. - Multilithed in U. S. A.

SIGNAL GENERATOR TS-535A/U

RELATIONSHIP TO OTHER EQUIPMENT:

ELECTROMECHANICAL DESCRIPTION:

Power Supply: 115 volts ±10 volts, AC, 50 to 63 cycles per second, single-phase, 185 watts.

Frequency Range: 7 to 160 kilocycles per second in four bands.

Frequency of Internal Calibrator: 5 kilocycles per second.

Type of Transmission: Continuous Wave or Amplitude Modulated.

Output Voltage: 0.5 microvolt to 1 volt (-6 decibels to +120 decibels for reference level at 1 microvolt).

Output Impedance: 5 ohms.

Modulation Frequencies:

Internal: 30% at 400 cycles per second.

External: 30% between 20 and 2000 cycles per second, 1 volt applied.

Accuracy:

Carrier Frequency: ±0.1% below 70 kilocycles per second; ±0.5% above 70 kilocycles per second.

Calibrator Frequency: ±0.01% after warmup.

Output Voltage: ±10%, or 1.0 microvolt, below 70 kilocycles per second; ±10%, or 0.5 microvolt, above 70 kilocycles per second.

MANUFACTURERS' OR CONTRACTORS' DATA:

Hewlett-Packard Company, 3000 Page Mill Road, Palo Alto, California; USN Contract Nos. NObsr-52305, dated 13 March 1951, and NObsr-63078, dated 30 December 1952.

TUBE COMPLEMENT:

2 JAN-6SJ7, 2 JAN-6V6GT/G, 1 JAN-6AG7, 1 JAN-6SA7, 3 JAN-6SN7W, 1 JAN-5U4G, 1 JAN-OC3/VR150, 1 JAN-6SQ7, 2 JAN-6L6GA, 1 JAN-6J5, 1 JAN-6H6, 1 JAN-2AP1.

REFERENCE DATA AND LITERATURE:

NAVSHIPS 91572(A) (Instruction Book).

SHIPPING DATA:

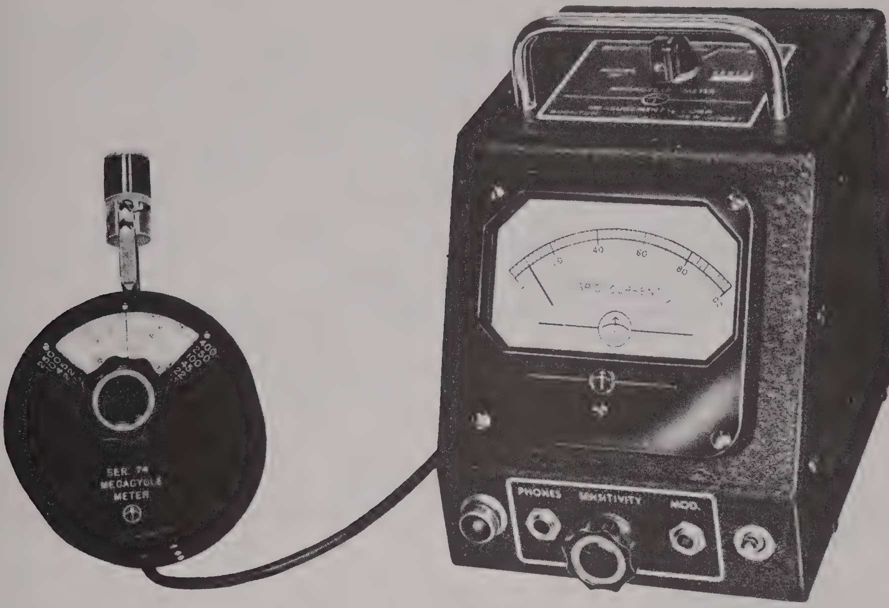
No. of Boxes	Contents & Identification	Volume (Cu. Ft.)	Overall Dimensions (inches)			Weight Packed (Lbs.)
			H	W	D	
1	Signal Generator TS-535A/U	9.1	21	30	25	180
1	Set of Equipment Spare Parts	2.0	10-1/2	22	14-1/2	61

SIGNAL GENERATOR TS-535A/U

EQUIPMENT SUPPLIED:

Quant. Per Eq'pt	Name and Nomenclature	Case Mat'l	Stock Numbers (USAF) (Navy) (Army)	Overall Dimensions (inches)			Weight (Lbs.)
				H	W	D	
1	Signal Generator TS-535A/U	Aluminum		27-1/2	20	26	162
1	External Attenuator CN-77/U			3/4	3/4	2-1/4	0.125
1	Output Cable CG-409/U			50 long			0.25
1	Output Cable CG-465/U			51 long			0.5
1	Output Cable CG-466/U			53 long			0.5
1	Adapter UG-201/U		8850-101950	3/4	3/4	1-13/32	0.06
1	Power Cable CAQI-62391			87 long			0.375
2	Instruction Book NavShips 900, 839			11-1/2	9	1/4	0.75
1	Calibration Book			11-1/2	9	1/4	0.25

MEGACYCLE METER
MODEL 59
(Measurements Corporation)



FUNCTIONAL DESCRIPTION:

A portable, general purpose, oscillator using the "grid dip" method for determining resonant frequency of tuned circuits in HF and VHF transmitters and receivers without turning on the transmitter or receiver power. It may be used as a variable frequency oscillator providing modulated or unmodulated signals for testing and aligning radio receivers and allied equipment. Other functions would include: use as an absorption type wavemeter; the measurements of capacitance, inductance, "Q", mutual inductance;use as a marker for use with a sweep-frequency generator. Resonance effects are indicated by a meter which measures relative grid current. The output frequency dial is calibrated in megacycles. Provision is made for attachment of headphones.

RELATIONSHIP TO OTHER EQUIPMENT:

Used as a interim for AN/PRM-10.

	AIR FORCE	NAVY	ARMY
TYPE CLASS.			
STOCK NOS.			
PROCUREM'T INFO.:			
PROCUREM'T COG.:		DESIGN COG.: Commercial	
F.I.I.N.:		FUNCTIONAL CLASS. NO.: 10.1.2	
	- Electronics Test Equipment -		Measurements 59

This project was supported by the USAF on Contract AF 33(600)28276 and monitored by WADC, ARDC - Carl L. Frederick, Bethesda, Md. - Multilithed in U. S. A.

MEGACYCLE METER
MODEL 59
(Measurements Corporation)

ELECTROMECHANICAL DESCRIPTION:

Circuit Information: Consists of an oscillator and a tuned circuit coil mounted externally so that it will be convenient for coupling to other circuits. In series with the grid leak are a DC microammeter and the headphone jack. Due to the absorption of energy at resonance, indications of dips in grid current on the microammeter will determine resonance of a circuit. A switch is provided to remove the plate voltage from the oscillator tube, changing the tube from a triode oscillator to a diode detector.

Power Supply: 110 to 120 volts, AC, 50 to 60 cycles per second, single phase,20 watts.

Frequency Range: 2.2 to 400 megacycles per second.

Type of Transmission: Continuous Wave, Amplitude Modulated Carrier.

Amplitude Modulation: 120 cycles per second internally. Provisions made for external modulation. Output is fixed at approximately 30% of CW.

Frequency Accuracy: Individually calibrated dial; direct reading to an accuracy of ±2%.

MANUFACTURERS' OR CONTRACTORS' DATA:

Measurements Corporation, Boonton, New Jersey; Approximate Cost per Unit, $168.00, 13 November 1950.

TUBE COMPLEMENT:

1 JAN-995, 1 JAN-OD3/VR-150, 1 JAN-5Y3GT.

REFERENCE DATA AND LITERATURE:

Manufacturer's Catalog C.

SHIPPING DATA:

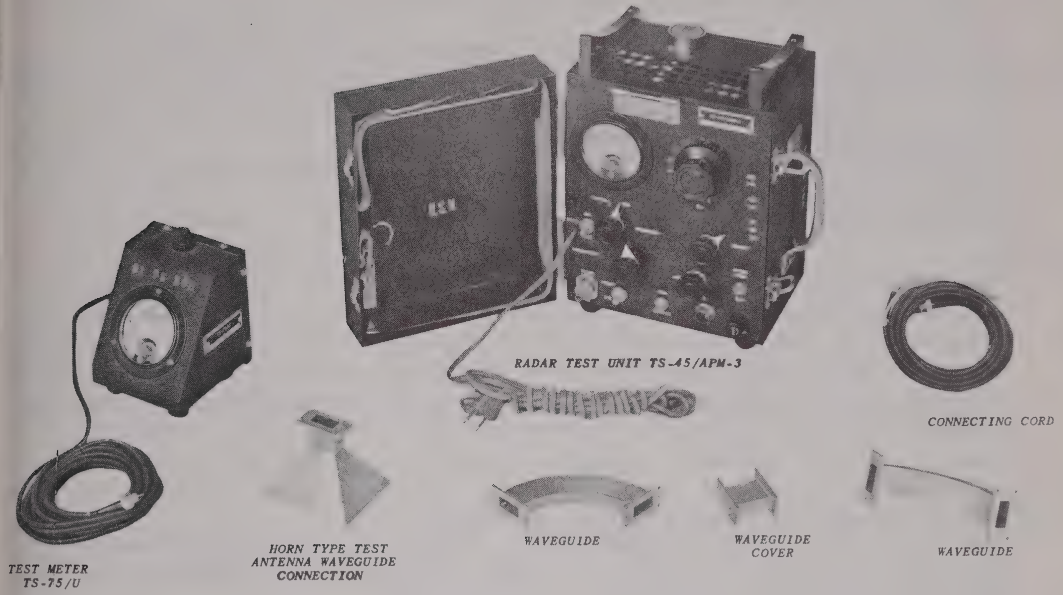
No. of Boxes	Contents & Identification	Volume (Cu. Ft.)	Over-all Dimensions (inches)			Weight Packed (Lbs.)
			H	W	D	
1	Megacycle Meter, Model 59					
	(Domestic Packed)	0.53	10	13	7	11
	(Export Packed)	2.5	17	13	19	30

MEGACYCLE METER
MODEL 59
(Measurements Corporation)

EQUIPMENT SUPPLIED:

Quant. Per Eq'pt	Name and Nomenclature	Case Mat'l	Stock Numbers (USAF) (Navy) (Army)	Over-all Dimensions (inches)			Weight (Lbs.)
				H	W	D	
1	Megacycle Meter Model 59 Power Unit			6-1/8	5-1/8	7-1/2	6.5
1	Oscillator Unit			3-3/4 dia.	2		1.0

RADAR TEST SET AN/APM-3


RADAR TEST UNIT TS-45/APM-3
CONNECTING CORD
TEST METER TS-75/U
HORN TYPE TEST ANTENNA WAVEGUIDE CONNECTION
WAVEGUIDE
WAVEGUIDE COVER
WAVEGUIDE

FUNCTIONAL DESCRIPTION:

A general purpose, portable frequency meter and power meter, consisting of Radar Test Unit TS-45/APM-3 and Auxiliary Test Kit TS-76/APM-3, designed to measure the average power output and frequency of continuous wave, modulated carrier wave or pulsed radio frequency transmitters and signal generators. Also contains a signal generator that is used for receiver alignment and sensitivity check.

Frequency calculations are made from a calibrated meter-dial and an associated chart. Resonance is indicated by a sharp dip in the reading of the microammeter. Power is determined by the reading of the microammeter and calibrated attenuator.

RELATIONSHIP TO OTHER EQUIPMENT:

AN/APM-3A is similar to as AN/APM-3 except that it has an improved power supply, a larger indicating meter and a larger case.

	AIR FORCE	NAVY	ARMY
TYPE CLASS.	Limited Standard		
STOCK NOS.	1690-327386500		3F4038-3
PROCUREM'T INFO.:			
PROCUREM'T COG.:	Navy	DESIGN COG.:	Navy, BuAer
F.I.I.N.:		FUNCTIONAL CLASS. NO.:	10. 1. 3
	- Electronics Test Equipment -		AN/APM-3

his project was supported by the USAF on Contract AF 33(600)28276 and monitored by WADC, ARDC - Carl L. Frederick, Bethesda, Md. - Multilithed in U. S. A.

RADAR TEST SET AN/APM-3

ELECTROMECHANICAL DESCRIPTION:

Power Supply: 45 watts at 107 to 127 volts, AC, 60 to 800 cycles per second, single phase.
Type of Reception: Continuous Wave, Modulated Carrier Wave, Pulse.
Type of Transmission: Continuous Wave.
Input:
- Frequency Range: 9300 to 9450 megacycles per second.
- Power Range: +10 dbm to +37 dbm. (This unit contains an attenuator which is calibrated from 0 to 30 decibels.
- Impedance: Choke coupling.

Output:
- Frequency Range: 9300 to 9400 megacycles per second.
- Power Range: 10 milliwatts average continuous wave power. While the signal generator section of this test set is designed for continuous wave operation, it may be externally pulsed by a pulse modulator unit such as the Model 79-B Pulse Generator manufactured by Measurements Corporation, Boonton, New Jersey.
- Impedance: Choke coupling.

Accuracy:
- Frequency Meter: ±2 megacycles per second.
- Power Meter: ±1.5 decibel for attenuator settings between 0 decibel and 16 decibels; ±2.5 decibels for attenuator settings between 16 decibels and 32 decibels.

Temperature Range: 0° F. to 120° F.

MANUFACTURERS' OR CONTRACTORS' DATA:

Western Electric Company, New York, New York; Contract No. NXsa32197.

TUBE COMPLEMENT:

1 Type 2K25, 1 JAN-6V6GT, 2 JAN-6X5GT, 1 JAN-6SL7GT, 2 JAN-OC3/VR-105, 1 JAN-1N21.

REFERENCE DATA AND LITERATURE:

CO AN 08-35TS45-2-M (Maintenance Instructions).

SHIPPING DATA:

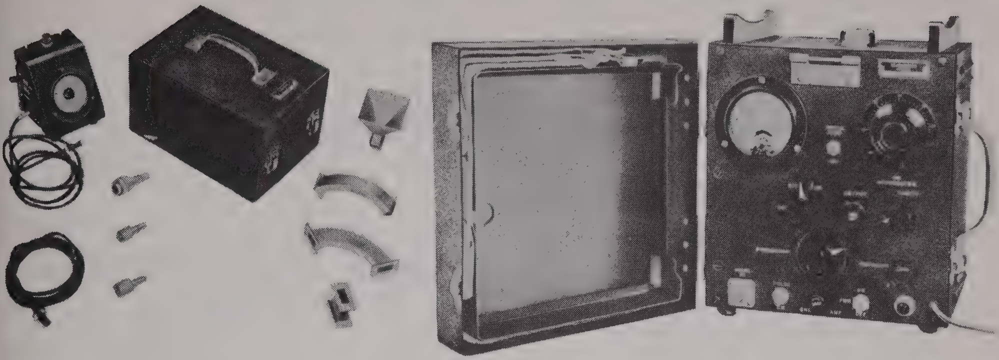
No. of Boxes	Contents & Identification	Volume (Cu. Ft.)	Over-all Dimensions (inches)			Weight Packed (Lbs.)
			H	W	D	
1	Test Set AN/APM-3					

RADAR TEST SET AN/APM-3

EQUIPMENT SUPPLIED:

Quant. Per Eq'pt	Name and Nomenclature	Case Mat'l	Stock Numbers (USAF) (Navy) (Army)	Over-all Dimensions (inches)			Weight (Lbs.)
				H	W	D	
1	Test Set AN/APM-3 Consisting of:		1690-327386500 3F4038-3				
1	Radar Test Unit TS-45/APM-3 (Including carrying strap)		7CAC-801319-58 R16-AN-TS-45/APM-3 3F4325-45	11-1/4	8-1/2	7	22
1	Auxiliary Test Kit TS-76/APM-3 Containing:		7CAC-801319-224 R16-AN-TS-76/APM-3 3F4325-76	10-1/4	7-1/16	7-13/16	7.5
1	Horn Antenna AT-65/UP		3F3988-65				
1	Radio Frequency Coupling UG-120/U		R16-AN-UG-120/U 2Z7390-120				
1	Radio Frequency Coupling UG-121/U		R16-AN-UG-121/U 2Z7390-121				
1	Radio Frequency Coupling UG-122/U		R16-AN-UG-122/U 2Z7390-122				
1	Test Meter TS-75/U		1690-327878800 R16-AN-TS-75/U 3F4325-75				
2	Plugs and Cord Assembly CG-150/U		R16-AN-CG-150/U 1F430-150	120 long			
1	Carrying Case						
1	Instruction Book						

RADAR TEST SET AN/APM-3A



FUNCTIONAL DESCRIPTION:

A general purpose, portable frequency-power-meter designed to measure the average power output and frequency of continuous wave, modulated carrier wave or pulsed radio frequency transmitters and signal generators. Also contains a signal generator that is used for receiver alignment and sensitivity check.

Frequency calculations are made from a calibrated meter-dial and an associated chart. Resonance is indicated by a sharp dip in the reading of the microammeter. Power is determined by the reading of the microammeter and calibrated attenuator.

RELATIONSHIP TO OTHER EQUIPMENT:

AN/APM-3A is the same as AN/APM-3 except that it has an improved power supply, a larger indicating meter and a larger case.

ELECTROMECHANICAL DESCRIPTION:

Power Supply: 107 to 127 volts, AC, 60 to 2400 cycles per second, single phase, 55 watts.

Type of Reception: Continuous Wave, Amplitude or Pulse Modulated.

Type of Transmission: Continuous Wave, Pulse Modulated (external).

Input:

Frequency Range: 9300 to 9450 megacycles per second.

Power Range: +10 dbm to +37 dbm. (This unit contains an attenuator which is calibrated from 0 to 30 decibels.)

Impedance: Choke coupling.

Output:

Frequency Range: 9300 to 9400 megacycles per second.

(Continued)

	AIR FORCE	NAVY	ARMY
TYPE CLASS.			
STOCK NOS.	1690-327386501	ASO-R16-T-1750	3F4038-3A
PROCUREM'T INFO.:			
PROCUREM'T COG.: Navy		DESIGN COG.: Navy, BuAer	
F.I.I.N.:		FUNCTIONAL CLASS. NO.: 10. 1. 3	
	- Electronics Test Equipment -		AN/APM-3A

This project was supported by the USAF on Contract AF 33(600)28276 and monitored by WADC, ARDC - Carl L. Frederick, Bethesda, Md. - Multilithed in U. S. A.

RADAR TEST SET AN/APM-3A

ELECTROMECHANICAL DESCRIPTION: (Continued)

Power Range: 10 milliwatts average continuous wave power. While the signal generator section of this test set is designed for continouus wave operation, it may be externally pulsed by a pulse modulator unit such as the Model 79-B Pulse Generator manufactured by Measurements Corporation, Boonton, New Jersey.

Impedance: Choke coupling.

Accuracy:

Frequency Meter: ±2 megacycles per second.

Power Meter: ±1.5 decibels for attenuator settings between 0 and 16 decibels; ±2.5 decibels for attenuator settings between 16 and 32 decibels.

Temperature Range: 0^{o} F. to 120^{o} F.

MANUFACTURERS' OR CONTRACTORS' DATA:

Western Electric Company, New York, New York; Contract No. NXsa-32197.

TUBE COMPLEMENT:

1 Type 2K25, 1 JAN-6V6GT, 2 JAN-6X5GT, 1 JAN-6SL7GT, 2 JAN-OC3/VR-105, 1 JAN-1N21.

REFERENCE DATA AND LITERATURE:

TO 16-55-206 (Spare Parts List).
CO AN 08-35TS45-2-M (Maintenance Instructions).

SHIPPING DATA:

No. of Boxes	Contents & Identification	Volume (Cu. Ft.)	Over-all Dimensions (inches)			Weight Packed (Lbs.)
			H	W	D	

EQUIPMENT SUPPLIED:

Quant. Per Eq'pt	Name and Nomenclature	Case Mat'l	Stock Numbers (USAF) (Navy) (Army)	Over-all Dimensions (inches)			Weight (Lbs.)
				H	W	D	
1	Radar Test Set AN/APM-3A Consisting of:		1690-327386501 R16-T-1750 3F4038-3A				
1	Radar Test Unit TS-45A/APM-3 (Including carrying strap)		7CAC-801319-58 R16-AN-TS-45A/APM-3 3F4325-45A	11-1/4	8-1/2	10-3/4	22.00

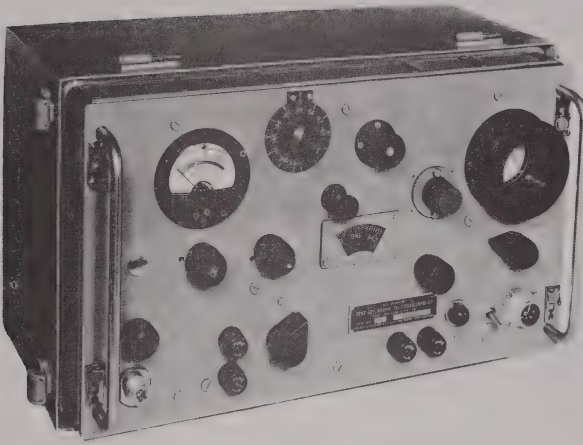
(Continued)

RADAR TEST SET AN/APM-3A

EQUIPMENT SUPPLIED: (Continued)

Quant. Per Eq'pt	Name and Nomenclature	Case Mat'l	Stock Numbers (USAF) (Navy) (Army)	Over-all Dimensions (inches)			Weight (Lbs.)
				H	W	D	
1	Auxiliary Test Kit TS-76A/APM-3 Containing:		7CAC-801319-224 R16-AN-TS-76A/APM-3 3F4325-76A	10-1/4	7-1/16	7-13/16	7.5
1	Horn Antenna AT-65/UP		3F3988-65				
1	Radio Frequency Coupling UG-120/U		R16-AN-UG-120/U 2Z7390-120				
1	Radio Frequency Coupling UG-121/U		R16-AN-UG-121/U 2Z7390-121				
1	Radio Frequency Coupling UG-122/U		R16-AN-UG-122/U 2Z7390-122				
1	Test Meter TS-75A/U		1690-32787800 R16-AN-TS-75A/U 3F4325-75A				
2	Plugs and Cord Assembly CG-150/U		R16-AN-CG-150/U 1F430-150	120 long			
1	Adapter UG-128/U						
1	Adapter UG-129/U						
1	Adapter UG-130/U						
1	Crystal Rectifier 1N21		3HK4956-7.1				
1	Attenuator Cord		2Z395.26	4	5/8		
1	Carrying Case CY-257/APM-3A		3F2529-257	10-1/4	7-3/16	7-1/16	7.5
1	Instruction Book						

RADAR TEST SET AN/APM-67
(TEST SET, RADAR, AN/APM-67)



FUNCTIONAL DESCRIPTION:

A portable, special purpose test set for preflight testing of a radio beacon. The test set is a multi-test instrument with a signal generator to aid in checking receiver sensitivity, a radio frequency wattmeter to measure average transmitter power, a cathode ray tube indicator to check transmitter coding, and an absorption type wavemeter to measure receiver-transmitter frequencies. It also has provision for measuring system crystal current and magnetron current.

RELATIONSHIP TO OTHER EQUIPMENT:

Used to test Radar Beacon AN/APN-69.

ELECTROMECHANICAL DESCRIPTION:

Power Supply: 115 volts, ±10%, AC, 380 to 1000 cycles per second, single phase, 150 watts maximum.

(Continued)

	AIR FORCE	NAVY	ARMY
TYPE CLASS.	Tentative Standard		
STOCK NOS.			
PROCUREM'T INFO.:	USAF Exhibit No. WCE-383.		
PROCUREM'T COG.:	USAF	DESIGN COG.:	USAF, ARL
F.I.I.N.:		FUNCTIONAL CLASS. NO.:	10.1.3
	- Electronics Test Equipment -		AN/APM-67

This project was supported by the USAF on Contract AF 33(600)28276 and monitored by WADC, ARDC - Carl L. Frederick, Bethesda, Md. - Multilithed in U. S. A.

RADAR TEST SET AN/APM-67
(TEST SET, RADAR, AN/APM-67)

ELECTROMECHANICAL DESCRIPTION: (Continued)

Signal Generator:

Frequency Range: 9326 to 9424 megacycles per second.

Pulse Repetition Rate: 167, 200, 250, 333, 500, and 1000 pulses per second.

Pulse Power Output: -40 to -52 dbm.

Pulse Width: 1.5 to 3.5 microseconds.

Pulse Rise Time: 0.1 microseconds.

Pulse Decay Time: 0.3 microseconds.

Accuracy: Pulse Repetition Rate: ±3%.

Pulse Power Output: ±2 decibels.

Pulse Width: ±10% between 2 and 3 microseconds; ±20% below 2 microseconds and above 3 microseconds.

Wavemeter:

Frequency Range: 9308.5 to 9311.5 megacycles per second and 9330 to 9420 megacycles per second.

Temperature Range: -40° C. to +55° C.

Humidity: 0 to 100%.

Power Indication Dip at Resonance: 45% on CW power, 15% on 0.5 microsecond duration pulses.

Accuracy: ±0.5 megacycles per second at 25° C. and 60% relative humidity for range 9308.5 to 9311.5 megacycles per second.

±1.25 megacycles per second at 25° C. and 60% relative humidity for range 9330 to 9420 megacycles per second.

±2.5 megacycles per second from 9310 to 9420 megacycles per second.

RF Wattmeter Input: 1.25 to 10 kilowatt peak pulses.

Power Measurement Accuracy: ±1.5 decibels (only signals of a nominal average level 11 decibels, +3 decibels, and -6 decibels above one milliwatt maybe measured).

Receiver Sensitivity: Measurement Accuracy: ±2 decibels. Signals from -42 dbm ±6 decibels are available from a type "N" connector. (This level may be effectively decreased by use of external directional couplers.)

Cathode Ray Tube Display: 60 microsecond sweep synchronized with the output pulse.

MANUFACTURERS' OR CONTRACTORS' DATA:

Sperry Gyroscope Company, Great Neck, Long Island, New York. USAF Development Contract AF 33(038)6854, Supplemental Agreement 9.

TUBE COMPLEMENT:

4 JAN-5814, 3 JAN-5687, 1 JAN-6AH6, 1 JAN-12AT7, 1 JAN-2BP1, 2 JAN-0B2, 1 JAN-6AU6, 1 JAN-5R4WGY, 1 JAN-1Z2, 1 JAN-2K25, 1 JAN-1N23B.

REFERENCE DATA AND LITERATURE:

RADAR TEST SET AN/APM-67
(TEST SET, RADAR, AN/APM-67)

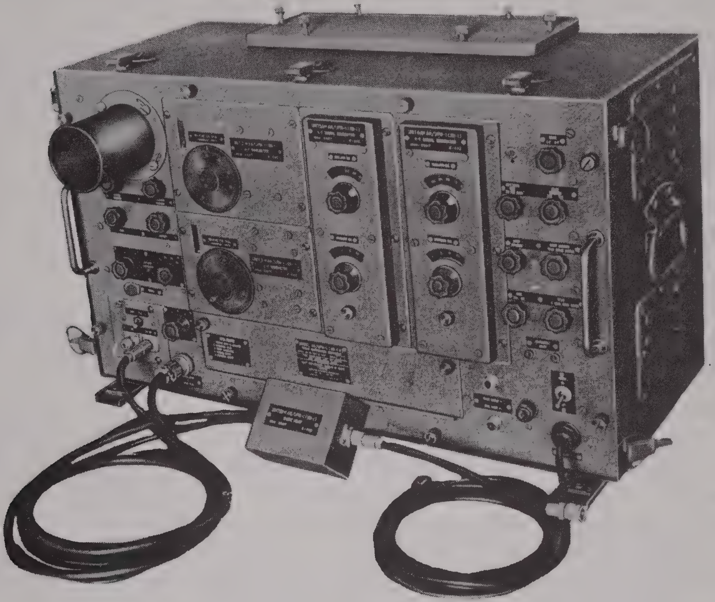
SHIPPING DATA:

No. of Boxes	Contents & Identification	Volume (Cu. Ft.)	Over-all Dimensions (inches)			Weight Packed (Lbs.)
			H	W	D	

EQUIPMENT SUPPLIED:

Quant. Per Eq'pt	Name and Nomenclature	Case Mat'l	Stock Numbers (USAF) (Navy) (Army)	Over-all Dimensions (inches)			Weight (Lbs.)
				H	W	D	
1	Test Set, Radar AN/APM-67 Including:	Aluminum		10-1/2	17-1/2	13-1/4	38
1	Test Set, Radar TS-770/APM-67	Aluminum		10-1/2	17-1/2	10	27
1	Cord CG-92C/U		7CAC-170265-248 3E6015-92C.3	96 long			1.0
1	Cable Assembly, Special Purpose Electrical CX-2292/U			96 long			0.6

RADAR MAINTENANCE EQUIPMENT AN/UPM-1
(TEST SET, RADAR, AN/UPM-1)



FUNCTIONAL DESCRIPTION:

A portable test equipment designed principally for bench testing or monitoring interrogator-responders or transponders such as the Navy YH and YJ beacons and Mark 3 and Mark 3G systems. It is capable of checking frequency, power output, pulse widths and shapes, recovery time, and receiver space alignment and sensitivity.

A three-inch oscilloscope is provided for visual observation of pulse widths and shapes, voltage measurements, and as an indicating device for the wavemeters.

RELATIONSHIP TO OTHER EQUIPMENT:

The AN/UPM-1, -1A, and -1B Radar Maintenance Equipments are identical except that the AN/UPM-1 does not include Antenna AT-50/U or Antenna AT-51/U; the AN/UPM-1A includes Antenna AT-50/U and Antenna AT-51/U but does not include Mounting Base MT-190/UPM-1; the AN/UPM-1B includes Antenna AT-50/U, Antenna AT-51/U, and Mounting Base MT-190/UPM-1.

For a detailed description of Wavemeters, see TS-133/UPM-1 and TS-134/UPM-1.

	AIR FORCE	NAVY	ARMY
TYPE CLASS.			
STOCK NOS.	7CAC-801319-218	F16-Q-121560-200	3F4042-1
PROCUREM'T INFO.:	Spec. No. RE9089		
PROCUREM'T COG.:	Navy	DESIGN COG.:	Navy, BuShips
F.I.I.N.:		FUNCTIONAL CLASS. NO.:	10.1.3
	- Electronics Test Equipment -		AN/UPM-1

his project was supported by the USAF on Contract AF 33(600)28276 and monitored by WADC, ARDC - Carl L. Frederick, Bethesda, Md. - Multilithed in U. S. A.

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RADAR MAINTENANCE EQUIPMENT AN/UPM-1
(TEST SET, RADAR, AN/UPM-1)

ELECTROMECHANICAL DESCRIPTION:

Power Supply: 80, 115, or 230 volts, single phase, AC, 60 to 1000 cycles per second. Power consumption, 140 to 210 watts.

Frequency Range: High frequency band, 460 to 570 megacycles per second, Signal Generator O-13/UPM-1 and Wavemeter TS-134/UPM-1. Low frequency band, 155 to 235 megacycles per second, Signal Generator O-12/UPM-1 and Wavemeter TS-133/UPM-1.

Accuracy: ±0.25% of true frequency.

External Synchronization Requirements:

Repetition Rate Range: 0 to 6000 pulses per second.

Pulse Width: 1/2 to 20 microseconds.

Pulse Amplitude: 10 to 120 volts.

Impedance Input: Greater than 100,000 ohms shunted by 40 micromicrofarads.

Frequency Range: 1000 cycles per second to 2.5 megacycles per second.

Internal Synchronization:

Pulse and Sweep Generator and Oscilloscope.

Repetition Rate: 60, 250 or 2500 pulses per second (250, 500 or 1200 pulses per second for modified Radar Maintenance Equipment AN/UPM-1) (each ±30%).

Sweep Duration: 40, 200, and 2000 microseconds (each ±30%).

Sweep Calibration Markers: 5, 20 or 200 microseconds.

Video Output Pulse: At least 50 volts open circuit or 25 volts across 500 ohms, 2 (+60%, -30%) or 7 (±30%) microseconds in width, rise time approximately 0.5 microseconds from 10% to 90% of peak amplitude.

Video Amplifier Characteristics:

Gain: At least 70 decibels ±6 decibels from 30 cycles per second to 750 kilocycles per second.

Output Impedance: Exceeds 100,000 ohms shunted by 100 micromicrofarads over the frequency range of 30 cycles per second to 1.5 megacycles per second.

Attenuation: 0, 20, 40 or 60 decibels below 1 volt in steps. 0 to 20 decibels below 1 volt continuous.

Signal Generators:

Output:

High Frequency: 0.1 volt rms maximum, during pulse, into 50 ohm load.

Low Frequency: 0.5 volt rms maximum, during pulse, into 50 ohm load.

Rise Time: Approximately 0.7 microseconds from 30% to 90% of peak amplitude.

Inverval Between Paired Pulses: 25, 100 or 800 microseconds (25, 100 or 400 microseconds for modified AN/UPM-1), each ±30%.

Pulse Widths· 2 (+60%, -30%) or 7 (±30%) microseconds.

Radio Frequency Attenuation: Maximum, 90 decibels below 1 volt rms during pulse.

Wavemeter: Each equipped with a diode peak detector and each uses the oscilloscope as a resonance indicating device.

Sensitivity: 0.1 inch scope deflection with 500 microwatts pulse power.

Resetability: ±0.1% of the original frequency.

(Continued)

RADAR MAINTENANCE EQUIPMENT AN/UPM-1
(TEST SET, RADAR, AN/UPM-1)

ELECTROMECHANICAL DESCRIPTION: (Continued)

Power Measuring Limits:

Diode Head: 4 watts average or 4000 watts pulse power.

Detection Junction Box: 1 watt average or 100 watts pulse power.

Auxiliary Features: These equipments are constructed so that the oscillators, wavemeters and detection junction box may be readily removed from the chassis for repair or replacement.

MANUFACTURERS' OR CONTRACTORS' DATA:

Hazeltine Electronics Corporation, 58-25 Little Neck Parkway, Little Neck, Long Island, New York; Contracts: NXsr-33782, NXsr-45455 and NXsa-36958; Approximate Cost per Unit, $1500.00.

TUBE COMPLEMENT:

1 JAN-2X2, 1 JAN-3BP1, 1 JAN-5U4-G, 1 JAN-6AG7, 3 JAN-6C4, 2 JAN-6J6, 2 JAN-6SH7, 9 JAN-6SN7-GT, 3 JAN-9005, 2 JAN-9006, 1 JAN-OD3/VR-150.

REFERENCE DATA AND LITERATURE:

TO 16-30UPM1-3 (Maintenance Instructions).

TO 16-30UPM1-21 (Modification to permit use with AN/APN-2B Radio Sets and AN/APN-68 Radar Sets).

SHIPPING DATA:

No. of Boxes	Contents & Identification	Volume (Cu. Ft.)	Overall Dimensions (inches)			Weight Packed (Lbs.)
			H	W	D	
1	Test Set, AN/UPM-1 (Export Packed)	12.91	26	39	22	216

EQUIPMENT SUPPLIED:

Quant. Per Eq'pt	Name and Nomenclature	Case Mat'l	Stock Numbers (USAF) (Navy) (Army)	Overall Dimensions (inches)			Weight (Lbs.)
				H	W	D	
1	Radar Maintenance Equipment AN/UPM-1		7CAC-801319-218 F16-Q-121560-200 3F4042-1	23	32	15	153.93
	Including:						
1	Console Rack MT-189/UPM-1 (Including 10' Power Cable W-101)		7CAC-680200 R16-AN-MT-189/UPM-1 3F3772-189	17-1/2	30-1/8	13-7/8	66.00

(Continued)

RADAR MAINTENANCE EQUIPMENT AN/UPM-1
(TEST SET, RADAR, AN/UPM-1)

EQUIPMENT SUPPLIED: (Continued)

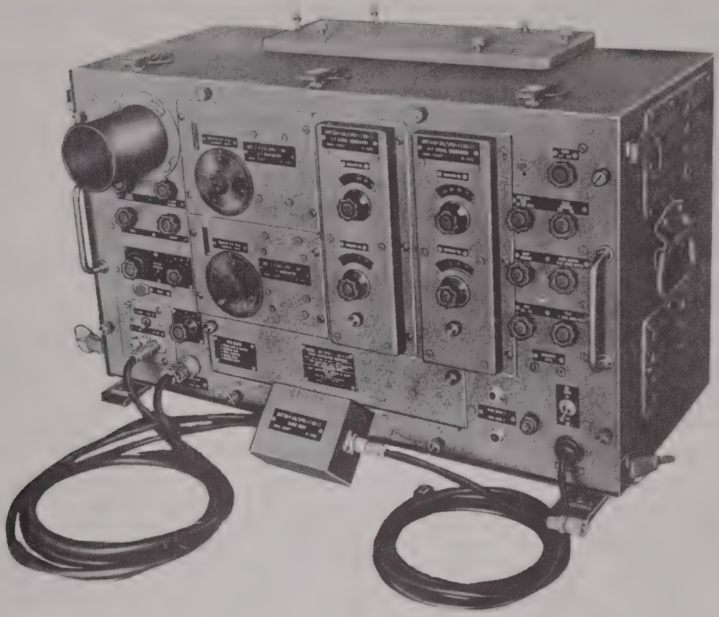
Quant. Per Eq'pt	Name and Nomenclature	Case Mat'l	Stock Numbers (USAF) (Navy) (Army)	Over-all Dimensions (inches)			Weight (Lbs.)
				H	W	D	
1	Wavemeter TS-134/UPM-1		7CAC-979572 R16-AN-TS-134/UPM-1 3F4325-134	8-1/8	6	6	3.80
1	Wavemeter TS-133/UPM-1		7CAC-979571-3 R16-AN-TS-133/UPM-1 3F4325-133	8-1/8	5-1/2	7-3/4	3.50
1	Oscillator O-13/UPM-1		7CAC-363966 R16-AN-O13/UPM-1 3F3583-13	5-1/8	8-5/8	11-1/2	9.30
1	Oscillator O-12/UPM-1		7CAC-363956 R16-AN-O12/UPM-1 3F3583-12	5-1/8	8-5/8	11-1/2	9.60
1	Diode Head CV-11/UPM-1		7CHE-A3234 N16-P-87007-3551 2C802-11	76	3-3/4	2-1/2	3.50
1	Detector-Junction Box J-94/UPM-1		7CAC-002910-46 N16-C-91728-1168 2Z5600-94	3-7/8	4	3-5/8	1.30
1	Dust Cover CW-24/UPM-1		7CAC-226247 R16-AN-CW-24/UPM-1 2Z3350-24	32	19-5/8	14-7/8	34.50
1	Mounting Base MT-190/UPM-1		7CAC-586600 R16-AN-MT-190/UPM-1 2Z6763-190	2-5/8	30-1/8	14-3/4	17.80
1	Synchronizing Cable			120 long			1.15
1	Probe Cable		R16-C-12746-20	42 long			0.50
1	Head Set HS-1201		1700-207478200 2B830	7-1/2	7-1/2	2	1.00
1	Oscilloscope Visor O-1201			3-9/16	4		0.25
	Diode Head Adapter Cables:						
						(Continued)	

RADAR MAINTENANCE EQUIPMENT AN/UPM-1
(TEST SET, RADAR, AN/UPM-1)

EQUIPMENT SUPPLIED: (Continued)

Quant. Per Eq'pt	Name and Nomenclature	Case Mat'l	Stock Numbers (USAF) (Navy) (Army)	Over-all Dimensions (inches)			Weight (Lbs.)
				H	W	D	
	Diode Head Adapter Cables:						
1	With Connector JAN-UG-12/U (and blank)			12 long			0.15
1	With Connector JAN-UG-12/U		8850-467415	12 long			0.25
1	With Connectors JAN-UG-12/U and Navy 49190			12 long			0.25
1	With Connectors JAN-UG-12/U & British 10H/701			12 long			0.25
	Test Cables:						
1	Oscillator Test Cable			25 long			0.40
1	Wavemeter Test Cable			25 long			0.25
1	Allen Head Wrench No. 8		7900-859490 R41-S-2446 6R57400	3/4	2-1/4	5/64	0.03
1	Allen Head Wrench No. 6		7900-859480 R41-W-2445 6R57400-6	1-3/4	1/2	1/16	0.03
1	Open-End Wrench (1/2" both ends)			4-1/2	1-1/16	5/32	0.12
						Total:	153.93

RADAR MAINTENANCE EQUIPMENT AN/UPM-1A
(TEST SET, RADAR, AN/UPM-1A)



FUNCTIONAL DESCRIPTION:

A portable test equipment designed principally for bench testing or monitoring interrogator-responders or transponders such as the Navy YH and YJ beacons and Mark 3 and Mark 3G systems. It is capable of checking frequency, power output, pulse widths and shapes, recovery time, and receive alignment and sensitivity.

A three-inch oscilloscope is provided for visual observation of pulse widths and shapes, voltage measurements, and as an indicating device for the wavemeters.

RELATIONSHIP TO OTHER EQUIPMENT:

The AN/UPM-1, -1A, and -1B Radar Maintenance Equipments are identical except that the AN/UPM-1 does not include Antenna AT-50/U or Antenna AT-51/U; the AN/UPM-1A includes Antenna AT-50/U and Antenna AT-51/U but does not include Mounting Base MT-190/UPM-1; the AN/UPM-1B includes Antenna AT-50/U, Antenna AT-51/U and Mounting Base MT-190/UPM-1.

For detailed description of Wavemeters, see TS-133/UPM-1 and TS-134/UPM-1.

	AIR FORCE	NAVY	ARMY
TYPE CLASS.			
STOCK NOS.	7CAC-801319-2175		3F4042-1A
PROCUREM'T INFO.:	BuShips Spec. No. CS-844		
PROCUREM'T COG.:	Navy	DESIGN COG.:	Navy, BuShips
F.I.I.N.:		FUNCTIONAL CLASS. NO.:	10.1.3
	- Electronics Test Equipment -		AN/UPM-1A

his project was supported by the USAF on Contract AF 33(600)28276 and monitored by WADC, ARDC - Carl L. Frederick, Bethesda, Md. - Multilithed in U. S. A.

RADAR MAINTENANCE EQUIPMENT AN/UPM-1A
(TEST SET, RADAR, AN/UPM-1A)

ELECTROMECHANICAL DESCRIPTION:

Power Supply: 80, 115, or 230 volts, single phase, AC, 60 to 1000 cycles per second. Power consumption, 140 to 210 watts.

Frequency Range: High frequency band, 460 to 570 megacycles per second, Signal Generator O-13/UPM-1 and Wavemeter TS-134/UPM-1. Low frequency band, 155 to 235 megacycles per second, Signal Generator O-12/UPM-1 and Wavemeter TS-133/UPM-1.

Accuracy: ±0. 25% of true frequency.

External Synchronization Requirements:

Repetition Rate Range: 0 to 6000 pulses per second.

Pulse Width: 1/2 to 20 microseconds.

Pulse Amplitude: 10 to 120 volts.

Impedance Input: Greater than 100, 000 ohms shunted by 40 micromicrofarads.

Frequency Range: 1000 cycles per second to 2. 5 megacycles per second.

Internal Synchronization:

Pulse and Sweep Generators and Oscilloscope:

Repetition Rate: 60, 250 or 2500 pulses per second (250, 500 or 1200 pulses per second for modified Radar Maintenance Equipment AN/UPM-1) (each ±30%).

Sweep Duration: 40, 200 and 2000 microseconds (each ±30%).

Sweep Calibration Markers: 5, 20 or 200 microseconds.

Video Output Pulse: At least 50 volts open circuit or 25 volts across 500 ohms, 2(+60%, -30%) or 7(±30%) microseconds in width, rise time approximately 0. 5 microseconds from 30% to 90% of peak amplitude.

Video Amplifier Characteristics:

Gain: At least 70 decibels (±6 decibels) from 30 cycles per second to 750 kilocycles per second.

Output Impedance: Exceeds 100,000 ohms shunted by 100 micromicrofarads over the frequency range of 30 cycles per second to 1. 5 megacycles per second.

Attenuation: 0, 20, 40 or 60 decibels below 1 volt in steps. 0 to 20 decibels below 1 volt continuous.

Signal Generators:

Output:

High Frequency: 0. 1 volt rms maximum, during pulse, into 50 ohm load.

Low Frequency: 0. 5 volt rms maximum, during pulse, into 50 ohm load.

Rise Time: Approximately 0.7 microseconds from 30% to 90% of peak amplitude.

Interval Between Paired Pulses: 25, 100 or 800 microseconds (25, 100 or 400 microseconds for modified AN/UPM-1), each ±30%.

Pulse Widths: 2(+60%, -30%) or 7 (±30%) microseconds.

Radio Frequency Attenuation: Maximum, 90 decibels below 1 volt rms during pulse.

(Continued)

RADAR MAINTENANCE EQUIPMENT AN/UPM-1A
(TEST SET, RADAR, AN/UPM-1A)

ELECTROMECHANICAL DESCRIPTION: (Continued)

Wavemeter: Each equipped with a diode peak detector and each uses the oscillator as a resonance indicating device.
  Sensitivity: 0.1 inch scope deflection with 500 microwatts pulse power.
  Resetability: ±0.1% of the original frequency.
Power Measuring Limits:
  Diode Head: 4 watts average or 4000 watts pulse power.
  Detection Juntion Box: 1 watt average or 100 watts pulse power.
Antennas:
  Both Dipole Antennas:
    Standing Wave Ratios: Less than 2 to 1 at antenna in the following bands:
      AT-50/U from 170 to 180 megacycles per second.
      AT-51/U from 500 to 520 megacycles per second.
Auxiliary Features: These equipments are constructed so that the oscillators, wavemeters and detection-junction box may be readily removed from the chassis for repair or replacement.

MANUFACTURERS' OR CONTRACTORS' DATA:

Hazeltine Electronics Corporation, 58-25 Little Neck Parkway, Little Neck, Long Island, New York; Contract Nos. NXsr-33782, NXsr-45455 and NXsr-93963. Navy Order No. 1477-DAY-44; 27 June 1944; Approximate Cost per Unit, $1500.00.

TUBE COMPLEMENT:

1 JAN-2X2, 1 JAN-3BP1, 1 JAN-5U4-G, 1 JAN-6AG7, 3 JAN-6C4, 2 JAN-6J6, 2 JAN-6SH7, 9 JAN-6SN7-GT, 3 JAN-9005, 2 JAN-9006, 1 JAN-OD3/VR-150.

REFERENCE DATA AND LITERATURE:

NavShips 900, 105 (Catalog of Electronics Test Equipment).
TO 16-30UPM1-3 (Maintenance Instructions).
TO 16-30UPM1-21 (Modification to permit use with AN/APN-2B Radio Sets and AN/APN-68 Radar Sets).

SHIPPING DATA:

No. of Boxes	Contents & Identification	Volume (Cu. Ft.)	Over-all Dimensions (inches)			Weight Packed (Lbs.)
			H	W	D	
1	Test Set AN/UPM-1A with accessories (Export Packed)	13.5	26	39	23	170

RADAR MAINTENANCE EQUIPMENT AN/UPM-1A
(TEST SET, RADAR, AN/UPM-1A)

EQUIPMENT SUPPLIED:

Quant. Per Eq'pt	Name and Nomenclature	Case Mat'l	Stock Numbers (USAF) (Navy) (Army)	Over-all Dimensions (inches)			Weight (Lbs.)
				H	W	D	
1	Radar Maintenance Equipment AN/UPM-1A (Complete) Including:	Metal	7CAC-801319-2175 3F4042-1A	23	32	15	138.5 (excluding accessories)
1	Console Rack (Including 10' Power Cable W-101) MT-189/UPM-1		7CAC-680200 R16-AN-MT-189/UPM-1 3F3772-189	17-1/2	30-1/8	13-7/8	66.00
1	Wavemeter TS-134/UPM-1		7CAC-97952 R16-AN-TS-134/UPM-1 3F4325-134	8-1/8	6	6	3.8
1	Wavemeter TS-133/UPM-1		7CAC-979571-3 R16-AN-TS-133/UPM-1 3F4325-133	8-1/8	5-1/2	7-3/4	3.5
1	Oscillator O-13/UPM-1		7CAC-363966 R16-AN-O13-UPM-1 3F3583-13	5-1/8	8-5/8	11-1/2	9.3
1	Oscillator O-12/UPM-1		7CAC-363956 R16-AN-O12-UPM-1 3F3583-12	5-1/8	8-5/8	11-1/2	9.6
1	Diode Head CV-11/UPM-1		7CHE-A3234 N16-P-87007-3551 2C802-11	76	3-3/4	2-1/2	3.5
1	Detector Junction Box J-94/UPM-1		7CAC-002910-46 N16-C-91728-1168 2Z5600-94	3-7/8	4	3-5/8	1.3
1	Dust Cover CW-24/UPM-1		7CAC-226247 R16-AN-CW24/UPM-1 2Z3350-24	32	19-5/8	14-7/8	34.5

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RADAR MAINTENANCE EQUIPMENT AN/UPM-1A
(TEST SET, RADAR, AN/UPM-1A)

EQUIPMENT SUPPLIED: (Continued)

Quant. Per Eq'pt	Name and Nomenclature	Case Mat'l	Stock Numbers (USAF) (Navy) (Army)	Over-all Dimensions (inches)			Weight (Lbs.)
				H	W	D	
1	Antenna AT-50/U		7CHE-A3425 R16-HZL-A3425 2A203-50	20-3/4	3-3/4	32-1/2	7.50
1	Antenna AT-51/U		7CHE-A3426 R16-HZL-A3426 2A203-51	20-3/4	3-3/4	12-1/2	7.00
2	Antenna Right-Angle Connector UG-27/U		8850-101200 2Z7390-27	1-15/16	1-5/8	3/4	0.30
2	Antenna Cable with Connectors each end (Navy 49268)			600 long			10.90
1	Synchronizing Cable			120 long			1.15
1	Probe Cable		 R16-C-2746-20	42 long			0.50
1	Head Set HS-1201		1700-207478200 2B830	7-1/2	7-1/2	2	1.00
1	Oscilloscope Visor O-1201			3-9/16	4		0.25
	Diode Head Adapter Cables:						
1	With Connector JAN-UG-12/U (and blank)			12 long			0.5
1	With Connector JAN-UG-12/U		8850-467415	12 long			0.25
1	With Connectors JAN-UG-12/U and Navy 49190			12 long			0.25

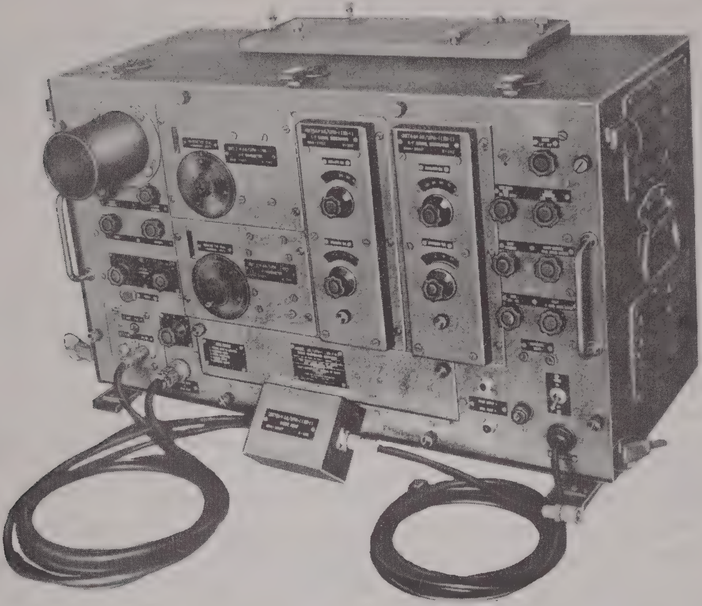
(Continued)

RADAR MAINTENANCE EQUIPMENT AN/UPM-1A
(TEST SET, RADAR, AN/UPM-1A)

EQUIPMENT SUPPLIED: (Continued)

Quant. Per Eq'pt	Name and Nomenclature	Case Mat'l	Stock Numbers (USAF) (Navy) (Army)	Over-all Dimensions (inches)			Weight (Lbs.)
				H	W	D	
1	With Connectors JAN-UG-12/U and British 10H/701			12 long			0.25
	Test Cables:						
1	Oscillator Test Cable			25 long			0.40
1	Wavemeter Test Cable			25 long			0.25
1	Allen Head Wrench No. 8		7900-859490 R41-S-2446 6R57400	3/4	2-1/4	5/64	0.03
1	Allen Head Wrench No. 6		7900-859480 R41-W-2445 6R57400-6	1-3/4	1/2	1/16	0.03
1	Open end Wrench (1/2" both ends)			4-1/2	1-1/16	5/32	0.12
1	Instruction Chart N-101						
1	Instruction Book TO16-30UPM1-3						

RADAR MAINTENANCE EQUIPMENT AN/UPM-1B
(TEST SET, RADAR, AN/UPM-1B)



UNCTIONAL DESCRIPTION:

A portable test equipment designed principally for bench testing or monitoring nterrogator-responders or transponders such as the Navy YH and YJ beacons and Mark 3 and Mark 3G systems. It is capable of checking frequency, power output, ulse widths and shapes, recovery time and receive alignment and sensitivity.

A three-inch oscilloscope is provided for visual observation of pulse widths and hapes, voltage measurements, and as an indicating device for the wavemeters.

ELATIONSHIP TO OTHER EQUIPMENT:

The AN/UPM-1, -1A, and -1B Radar Maintenance Equipments are identical except that the AN/UPM-1 does not include Antenna AT-50/U or Antenna AT-51/U; he AN/UPM-1A includes Antenna AT-50/U and Antenna AT-51/U but does not inlude Mounting Base MT-190/UPM-1; the AN/UPM-1B includes Antenna AT-50/U; ntenna AT-51/U and Mounting Base MT-190/UPM-1.

For detailed description of Wavemeters, see TS-133/UPM-1 and TS-134/UPM-1.

	AIR FORCE	NAVY	ARMY
TYPE CLASS.	Standard		
STOCK NOS.	7CAC-801319-2175	F16-T-20126-1701	3F4042-1B
PROCUREM'T INFO.:			
PROCUREM'T COG.:	Navy	DESIGN COG.:	Navy, BuShips
F.I.I.N.:		FUNCTIONAL CLASS. NO.:	10.1.3
	- Electronics Test Equipment -		AN/UPM-1B

is project was supported by the USAF on Contract AF 33(600)28276 and monitored by WADC, ARDC - Carl L. Frederick, Bethesda, Md. - Multilithed in U. S. A.

RADAR MAINTENANCE EQUIPMENT AN/UPM-1B
(TEST SET, RADAR, AN/UPM-1B)

ELECTROMECHANICAL DESCRIPTION:

Power Supply: 80, 115, or 230 volts, single phase, AC, 60 to 1000 cycles per second. Power consumption, 140 to 210 watts.

Frequency Range: High frequency band, 460 to 570 megacycles per second, Signal Generator O-13/UPM-1 and Wavemeter TS-134/UPM-1. Low frequency band, 155 to 235 megacycles per second, Signal Generator O-12/UPM-1 and Wavemeter TS-133/UPM-1.

Accuracy: ±0.25% of true frequency.

External Synchronization Requirements:

- Repetition Rate Range: 0 to 6000 pulses per second.
- Pulse Width: 1/2 to 20 microseconds.
- Pulse Amplitude: 10 to 120 volts.
- Impedance Input: Greater than 100,000 ohms shunted by 40 micromicrofarads.
- Frequency Range: 1000 cycles per second to 2.5 megacycles per second.

Internal Synchronization:

- Pulse and Sweep Generator and Oscilloscope:
- Repetition Rate: 60, 250 or 2500 pulses per second (250, 500 or 1200 pulses per second for modified Radar Maintenance Equipment AN/UPM-1) (each ±30%).
- Sweep Duration: 40, 200 and 2000 microseconds (each ±30%).
- Sweep Calibration Markers: 5, 20 or 200 microseconds.
- Video Output Pulse: At least 50 volts open circuit or 25 volts across 500 ohms, 2 (+60%, -30%) or 7 (±30%) microseconds in width, rise time approximately 0.5 microseconds from 30% to 90% of peak amplitude.

Video Amplifier Characteristics:

- Gain: At least 70 decibels ±6 decibels from 30 cycles per second to 750 kilocycles per second.
- Output Impedance: Exceeds 100,000 ohms shunted by 100 micromicrofarads over the frequency range of 30 cycles per second to 1.5 megacycles per second.
- Attenuation: 0, 20, 40 or 60 decibels below 1 volt in steps. 0 to 20 decibels below 1 volt continuous.

Signal Generators:

- Output:
  - High Frequency: 0.1 volt rms maximum, during pulse, into 50 ohm load.
  - Low Frequency: 0.5 volt rms maximum, during pulse, into 50 ohm load.
- Rise Time: Approximately 0.7 microseconds from 30% to 90% of peak amplitude.
- Interval Between Paired Pulses: 25, 100 or 800 microseconds (25, 100 or 400 microseconds for modified AN/UPM-1), each ±30%.
- Pulse Widths: 2 (+60%, -30%) or 7 (±30%) microseconds.
- Radio Frequency Attenuation: Maximum, 90 decibels below 1 volt rms during pulse.

Wavemeter: Each equipped with a diode peak detector and each uses the oscilloscope as a resonance indicating device.

- Sensitivity: 0.1 inch scope deflection with 500 microwatts pulse power.
- Resetability: ±0.1% of the original frequency.

(Continued)

RADAR MAINTENANCE EQUIPMENT AN/UPM-1B
(TEST SET, RADAR, AN/UPM-1B)

ELECTROMECHANICAL DESCRIPTION: (Continued)

Power Measuring Limits:

Diode Head: 4 watts average or 4000 watts pulse power.

Detection Junction Box: 1 watt average or 100 watts pulse power.

Antennas: Both dipole antennas.

Standing Wave Ratios: Less than 2 to 1 at antenna in the following bands.

AT-50/U from 170 to 180 megacycles per second.

AT-51/U from 500 to 520 megacycles per second.

Auxiliary Features: These equipments are constructed so that the oscillators, wavemeters and detection-junction box may be readily removed from the chassis for repair or replacement.

MANUFACTURERS' OR CONTRACTORS' DATA:

Hazeltine Electronics Corporation, 58-25 Little Neck Parkway, Little Neck, Long Island, New York; Contract Nos. NXsa-36958, NXsr-33782 and NXsr-45455.

TUBE COMPLEMENT:

1 JAN-2X2, 1 JAN-3BP1, 1 JAN-5U4-G, 1 JAN-6AG7, 3 JAN-6C4, 2 JAN-6J6, 2 JAN-6SH7, 9 JAN-6SN7-GT, 3 JAN-9005, 2 JAN-9006, 1 JAN-OD3/VR-150.

REFERENCE DATA AND LITERATURE:

TO 16-30UPM1-3 (Maintenance Instructions).

TO 16-30UPM1-21 (Modification to permit use with AN/APN-2B Radio Sets and AN/APN-68 Radar Sets).

SHIPPING DATA:

No. of Boxes	Contents & Identification	Volume (Cu. Ft.)	Over-all Dimensions (inches)			Weight Packed (Lbs.)
			H	W	D	
1	Test Set AN/UPM-1B with accessories (Export Packed)	16.73	30	39	23	190

RADAR MAINTENANCE EQUIPMENT AN/UPM-1B
(TEST SET, RADAR, AN/UPM-1B)

EQUIPMENT SUPPLIED:

Quant. Per Eq'pt	Name and Nomenclature	Case Mat'l	Stock Numbers (USAF) (Navy) (Army)	Over-all Dimensions (inches)			Weight (Lbs.)
				H	W	D	
1	Radar Maintenance Equipment AN/UPM-1B Including:		7CAC-801319-2175 F16-T-20126-1701 3F4042-1B	23	32	15	138.5 (excluding accessories)
1	Console Rack (including 10' Power Cable W-101) MT-189/UPM-1		7CAC-680200 R16-AN-MT-189/UPM-1 3F3772-189	17-1/2	30-1/8	13-7/8	66.0
1	Wavemeter TS-134/UPM-1		7CAC-979572 R16-AN-TS-134/UPM-1 3F4325-134	8-1/8	6	6	3.8
1	Wavemeter TS-133/UPM-1		7CAC-979571-3 R16-AN-TS-133/UPM-1 3F4325-133	8-1/8	5-1/2	7-3/4	3.5
1	Oscillator O-13/UPM-1		7CAC-363966 R16-AN-O13/UPM-1 3F3583-13	5-1/8	8-5/8	11-1/2	9.3
1	Oscillator O-12/UPM-1		7CAC-363956 R16-AN-O12/UPM-1 3F3583-12	5-1/8	8-5/8	11-1/2	9.6
1	Diode Head CV-11/UPM-1		7CHE-A3234 N16-P-87007-3551 2C802-11	76	3-3/4	2-1/2	3.5
1	Detector Junction Box J-94/UPM-1		7CAC-002910-46 N16-C-91728-1168 2Z5600-94	3-7/8	4	3-5/8	1.3
1	Dust Cover CW-24/UPM-1		7CAC-226247 R16-AN-CW-24/UPM-1 2Z3350-24	32	19-5/8	14-7/8	34.5
1	Antenna AT-50/U		7CHE-A3425 R16-HZL-A3425 2A203-50	20-3/4	3-3/4	32-1/2	7.5

(Continued)

RADAR MAINTENANCE EQUIPMENT AN/UPM-1B
(TEST SET, RADAR, AN/UPM-1B)

EQUIPMENT SUPPLIED: (Continued)

Quant. Per Eq'pt	Name and Nomenclature	Case Mat'l	Stock Numbers (USAF) (Navy) (Army)	Over-all Dimensions (inches)			Weight (Lbs.)
				H	W	D	
1	Antenna AT-51/U		7CHE-A3426 R16-HZL-A3426 2A203-51	20-3/4	3-3/4	12-1/2	7.0
2	Antenna Right-Angle Connector UG-27/U		8850-101200 2Z7390-27	1-15/16	1-5/8	3/4	0.30
2	Antenna Cable with Connectors each end (Navy 49268)			600 long			10.9
1	Mounting Base MT-190/UPM-1		7CAC-586600 R16-AN-MT-190/UPM-1 2Z6763-190	2-5/8	30-1/8	14-3/4	17.8
1	Synchronizing Cable			120 long			1.15
1	Probe Cable		R16-C-2746-20	42 long			0.5
1	Head Set HS-1201		1700-207478200 2B830	7-1/2	7-1/2	2	1.0
1	Oscilloscope Visor O-1201 Diode Head Adapter Cables:			3-9/16	4		0.25
1	With Connector JAN-UG-12/U (and blank)			12 long			0.15
1	With Connector JAN-UG-12/U		8850-467415	12 long			0.25
1	With Connectors JAN-UG-12/U and Navy 49190			12 long			0.25

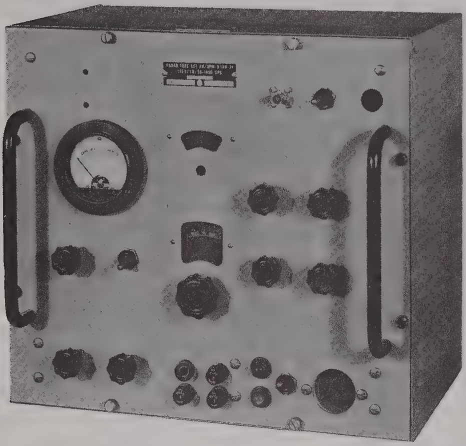
(Continued)

RADAR MAINTENANCE EQUIPMENT AN/UPM-1B
(TEST SET, RADAR, AN/UPM-1B)

EQUIPMENT SUPPLIED: (Continued)

Quant. Per Eq'pt	Name and Nomenclature	Case Mat'l	Stock Numbers (USAF) (Navy) (Army)	Over-all Dimensions (inches)			Weight (Lbs.)
				H	W	D	
1	With Connectors JAN-UG-12/U and British 10H/701 Test Cables:			12 long			0.25
1	Oscillator Test Cable			25 long			0.40
1	Wavemeter Test Cable			25 long			0.25
1	Allen Head Wrench No. 8		7900-859490 R41-S-2446 6R57400	3/4	2-1/4	5/64	0.03
1	Allen Head Wrench No. 6		7900-859480 R41-W-2445 6R57400-6	1-3/4	1/2	1/16	0.03
1	Open End Wrench (1/2" both ends)			4-1/2	1-1/16	5/32	0.12
1	Instruction Chart N-101 Spare Fuses F-103, F-104						

RADAR TEST SET AN/UPM-9(XN-2)



FUNCTIONAL DESCRIPTION:

A portable general purpose test set designed to operate as a combination signal generator, frequency meter, and power meter. The equipment is used in testing receiver and transmitter operation of radar sets in its ranges. It provides RF signals at an accurately adjustable frequency and power level; measures frequency and power level of RF signals from an external source; and detects, amplifies, visibly displays, and measures frequency of components of power versus frequency spectra of pulse modulated or other RF signals.

RELATIONSHIP TO OTHER EQUIPMENT:

ELECTROMECHANICAL DESCRIPTION:

Circuit Information: The circuit includes an RF oscillator which provides test signals to an external load. In order to determine the power level of the test signals or of RF input signals, the signal is attenuated to a standard power level. The

(Continued)

	AIR FORCE	NAVY	ARMY
TYPE CLASS.		Experimental	
STOCK NOS.			
PROCUREM'T INFO.:			
PROCUREM'T COG.: USN		DESIGN COG.: USN, BuAer	
F.I.I.N.:		FUNCTIONAL CLASS. NO.: 10.1.3	

This project was supported by the USAF on Contract AF 33(600)28276 and monitored by WADC, ARDC - Carl L. Frederick, Bethesda, Md. - Multilithed in U. S. A

RADAR TEST SET AN/UPM-9(XN-2)

ELECTROMECHANICAL DESCRIPTION: (Continued)

power level of the unknown signal is then read directly from the front panel attenuator control.

The frequency of output or input signals is determined by tuning a reaction cavity to resonance at the frequency of the unknown signal. Calibrations on the cavity tuning control indicate the resonant frequency.

A spectrum analyzer circuit resolves and visibly displays the frequency versus power spectra of RF input signals.

Power Supply: 103.5 to 126.5 volts, AC, 50 to 1000 cycles per second.
Frequency Range: 5100 to 5900 megacycles per second.
Type of Transmission: External, Frequency Modulated, Pulse Modulated, or Continuous Wave; Internal, Frequency Modulated.
Voltage Standing Wave Ratio: 1.29, maximum.
Pulse Duration: 0.3 to 10 microseconds.
Pulse Repetition Rate: 200 to 4000 pulses per second.
Input Impedance: 50,000 ohms shunted by 50 micromicrofarads.
Input Power Level: 5 to 30 dbm.
Output Power Level: -30 to -80 dbm.

MANUFACTURERS' OR CONTRACTORS' DATA:

Polytechnic Research and Development Company, Inc., 66 Court Street, Brooklyn 2, New York; Navy Contract Nos. NOas 53-1125C and NOas 54-116C.

TUBE COMPLEMENT:

3 JAN-6L6GA, 1 JAN-5RWGY, 2 JAN-6X4W, 5 JAN-6AU6, 2 JAN-5651, 1 JAN-4H12, 1 JAN-6AK6, 2 JAN-12AU7, 2 JAN-656, 1 JAN-RK6115, 1 JAN-1N43, 1 JAN-1N70.

REFERENCE DATA AND LITERATURE:

Handbook of Maintenance Instructions, BuAer.

SHIPPING DATA:

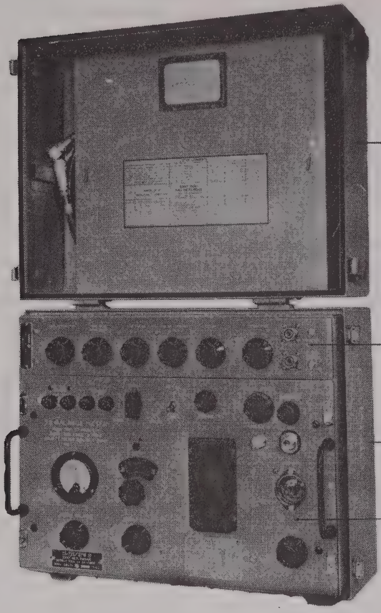
No. of Boxes	Contents & Identification	Volume (Cu. Ft.)	Overall Dimensions (inches)			Weight Packed (Lbs.)
			H	W	D	

RADAR TEST SET AN/UPM-9(XN-2)

EQUIPMENT SUPPLIED:

Quant. Per Eq'pt	Name and Nomenclature	Case Mat'l	Stock Numbers (USAF) (Navy) (Army)	Overall Dimensions (inches)			Weight (Lbs.)
				H	W	D	
1	Radar Test Set AN/UPM-9(XN-2)			14-1/2	15-15/16	11-15/16	44
1	Transit Case			15-3/16	19-1/2	18	33
1	RF Cable Assembly			72 long			1.4
3	Video Cable Assembly			72 long			0.2

RADAR TEST SET AN/UPM-10
(TEST SET, RADAR, AN/UPM-10)


COVER, TEST SET CW-288/UPM-10
GENERATOR, PULSE SG-63/UPM-10
CASE, TEST SET CY-1151/UPM-10
TEST SET, RADAR TS-739/UPM-10

FUNCTIONAL DESCRIPTION:

A portable microwave signal generator used for testing and adjusting beacon equipment and radar systems. The set measures the power and frequency of external signals and supplies output signals of known power level and frequency.

RELATIONSHIP TO OTHER EQUIPMENT:

Similar in function to Test Set TS-642/U and replaces Test Set TS-120/UP. Similar to General Communication Model P-280.

ELECTROMECHANICAL DESCRIPTION:

Circuit Information: Composed of a radio frequency detector, video amplifier, sawtooth sweep generator, radio frequency oscillator, power set attenuator, frequency meter, power monitor, calibrated attenuator, step attenuator, power supply, and a pulse generator modulator.

Power Supply: 115 volts, ±10%, AC, single phase, 50 to 1000 cycles per second.

(Continued)

	AIR FORCE	NAVY	ARMY
TYPE CLASS.	Standard		
STOCK NOS.	7CAC-801319-2172		3F3946-10
PROCUREM'T INFO.:	Navy Spec. No. SHIPS-R-157, February 1950		
PROCUREM'T COG.:	Navy	DESIGN COG.:	Navy, BuShips
F.I.I.N.:		FUNCTIONAL CLASS. NO.:	10.1.3
	- Electronics Test Equipment -		AN/UPM-10

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RADAR TEST SET AN/UPM-10
(TEST SET, RADAR, AN/UPM-10)

ELECTROMECHANICAL DESCRIPTION: (Continued)

Frequency Range: 8500 to 9600 megacycles per second.
Type of Transmission: FM, PM, Square Wave, and CW.
Pulse Repetition Rate: 0 to 3000 pulses per second.
Pulse Width: 0.5 to 6.0 microseconds.
Pulse Rise Time: 0.5 microseconds.
Power Output: 5 to 500 watts peak.
Power Range: 7 dbm to 30 dbm (transmitting power measurements), -7 to -40 dbm and -42 to -83 dbm (receiver measurements).
Accuracy: ±2.0 dbm of calibrated attenuator reading.
±2.5 megacycles per second frequency over entire range.
±1.0 megacycle per second at calibrated point 9310 megacycles per second.
Accuracy values were taken at 25° C., 60% relative humidity.

MANUFACTURERS' OR CONTRACTORS' DATA:

General Communication Company, 681 Beacon Street, Boston 15, Massachusetts; Contract No. NObsr-49223, 30 June 1950; Approximate Cost per Unit, $2065.00.

TUBE COMPLEMENT:

2 JAN-OC3/VR-105, 2 JAN-2D21, 1 JAN-2K25, 1 JAN-5R4GY, 2 JAN-6AH6, 1 JAN-6AN5, 1 JAN-6SH7, 2 JAN-6SL7GT, 1 JAN-6X4, 1 JAN-6Y6G, 2 JAN-12AU7.

REFERENCE DATA AND LITERATURE:

NavShips 91549 (Instruction Book).

SHIPPING DATA:

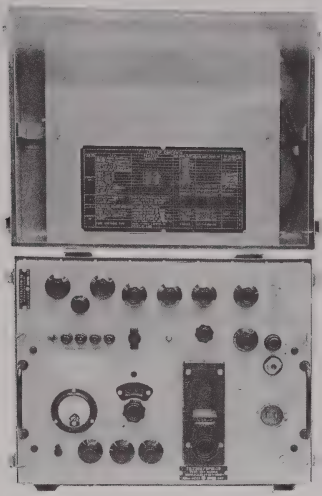
No. of Boxes	Contents & Identification	Volume (Cu. Ft.)	Over-all Dimensions (inches)			Weight Packed (Lbs.)
			H	W	D	
1	Radar Test Set AN/UPM-10 (Domestic Packed)	4.4	15-1/2	24-3/10	20	95

RADAR TEST SET AN/UPM-10
(TEST SET, RADAR, AN/UPM-10)

EQUIPMENT SUPPLIED:

Quant. Per Eq'pt	Name and Nomenclature	Case Mat'l	Stock Numbers (USAF) (Navy) (Army)	Over-all Dimensions (inches)			Weight (Lbs.)
				H	W	D	
1	Radar Test Set AN/UPM-10	Aluminum Case	7CAC-801319-2172 3F3946-10	12-4/5	19-1/2	14-9/10	65
1	Radar Test Set TS-739/UPM-10			9-1/2	17-3/10	10	28
1	Pulse Generator SG-63/UPM-10			8-2/5	17-3/10	3-1/2	12
1	Case CY-1151/UPM-10			8-1/10	18	14-9/10	6
1	Cover CW-288/UPM-10			6-1/10	19-1/2	14-1/2	19
1	Cord CG-92A/U		7CAC-170265-42 3E6015-92.2	96 long			1
1	Cord CG-638/U		7CAC-170265-46 3E6015-638-6	72 long			1
1	Cord CG-337/U		3300-322001039 3E7350.1-72.17	72			0.3
1	Coaxial Cable Connector, Navy Type 49192		8850-107800 2Z299-359				0.2
1	Antenna Pickup AT-68/UP		7CAC-045705 N16-H-88041-2151 3F3988-68	4-1/2	6-4/5	2-3/10	0.3
1	Set Operating Maintenance Repair Parts						
2	Instruction Book NavShips 91549						

RADAR TEST SET AN/UPM-10A



FUNCTIONAL DESCRIPTION:

A portable microwave signal generator used for testing and adjusting beacon equipment and radar systems. The set measures the power and frequency of external signals and supplies output signals of known power level and frequency.

RELATIONSHIP TO OTHER EQUIPMENT:

Similar to General Communication Model P-280C.

ELECTROMECHANICAL DESCRIPTION:

Circuit Information: Composed of a radio frequency detector, video amplifier, sawtooth sweep generator, radio frequency oscillator, power set attenuator, frequency meter, power monitor, calibrated attenuator, step attenuator, power supply, and a pulse generator modulator.

(Continued)

	AIR FORCE	NAVY	ARMY
TYPE CLASS.			
STOCK NOS.	7CAC-801319-22362		3F3946-10A
PROCUREM'T INFO.:	Spec. SHIPS-R-157, February 1950		
PROCUREM'T COG.:	USN	DESIGN COG.:	USN, BuShips
F.I.I.N.:		FUNCTIONAL CLASS. NO.:	10.1.3
	- Electronics Test Equipment -		AN/UPM-10A

This project was supported by the USAF on Contract AF 33(600)28276 and monitored by WADC, ARDC - Carl L. Frederick, Bethesda, Md. - Multilithed in U. S. A.

RADAR TEST SET AN/UPM-10A

ELECTROMECHANICAL DESCRIPTION: (Continued)

Power Supply: 115 volts, ±10%, AC, single-phase, 50 to 1000 cycles per second.

Frequency Range: 8500 to 9600 megacycles per second.

Type of Transmission: FM, PM, Square Wave, and CW.

Pulse Repetition Rate: 0 to 4000 pulses per second.

Pulse Length: 0.55, 1.0, and 2.35 microseconds, fixed; 0.2 to 5.0 microseconds continuously variable.

Pulse Rise Time: 0.5 to 6 microseconds.

Power Output: 5 to 500 watts peak.

Power Range: +7 to +30 dbm input; -7 to -45 dbm and -42 to -85 dbm output.

Accuracy:

±1.5 dbm of calibrated attenuator reading.

±2.5 megacycles per second frequency over entire range.

±1.0 megacycle per second at calibrated point 9310 megacycles per second. Accuracy values were taken at 25°C. (77°F.), 60% relative humidity.

MANUFACTURERS' OR CONTRACTORS' DATA:

General Communication Company, 681 Beacon Street, Boston 15, Massachusetts; Contract No. NObsr-49223, 30 June 1950; Approximate Cost per Unit, $2065.00.

TUBE COMPLEMENT:

2 JAN-OC3/VR-105, 2 JAN-2D21, 1 JAN-2K25, 1 JAN-5R4GY, 2 JAN-6AH6, 1 JAN-6AN5, 1 JAN-6SH7, 2 JAN-6SL7GT, 1 JAN-6X4, 1 JAN-6Y6G, 2 JAN-12AU7.

REFERENCE DATA AND LITERATURE:

NAVSHIPS 92195 (Instruction Book).

SHIPPING DATA:

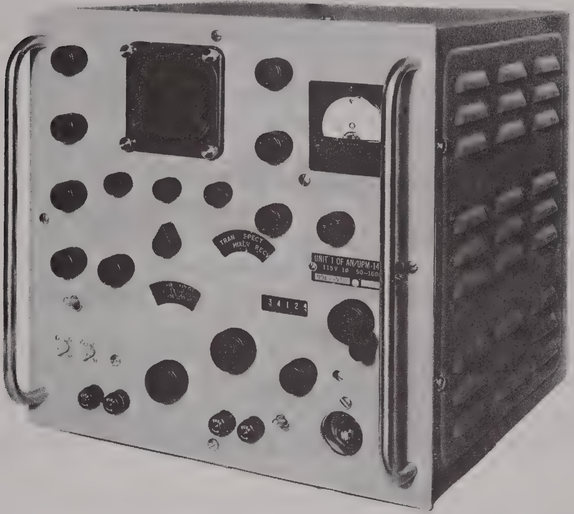
No. of Boxes	Contents & Identification	Volume (Cu. Ft.)	Over-all Dimensions (inches)			Weight Packed (Lbs.)
			H	W	D	
1	Radar Test Set AN/UPM-10A (Domestic Packed)	4.4	15-1/2	24-3/10	20	95

RADAR TEST SET AN/UPM-10A

EQUIPMENT SUPPLIED:

Quant. Per Eq'pt	Name and Nomenclature	Case Mat'l	Stock Numbers (USAF) (Navy) (Army)	Over-all Dimensions (inches)			Weight (Lbs.)
				H	W	D	
1	Radar Test Set AN/UPM-10A	Aluminum	7CAC-801319-22362 3F3946-10A	12-3/4	19-1/2	14-7/8	65
	Including:						
1	Radar Test Set TS-739A/UPM-10			9-1/2	17-3/10	10	28
1	Pulse Generator SG-63A/UPM-10			8-2/5	17-3/10	3-1/2	12
1	Case CY-1151A/UPM-10			8-1/8	17-7/8	14-1/2	6
1	Cover CW-288A/UPM-10			5-9/16	19-7/16	14-3/8	19
1	Cord CG-92B/U			96 long			1
1	Cable Assembly CG-530/U			72 long			1
1	Cable Assembly CG-530/U			15 long			
1	Cord CG-337/U		3300-322001039 3E7350.1-72.17	72 long			0.3
1	Adapter UG-273/U		8850-102000 N17-C-67988-5260				
1	Adapter Connector UG-57B/AP		8850-108741 N17-C-68241-3601				
1	Antenna Pickup AT-68/UP		7CAC-045705 N16-A52545-1626 3F3988-68	4-1/2	6-4/5	2-3/10	0.3
2	Instruction Book						

RADAR TEST SET AN/UPM-14



FUNCTIONAL DESCRIPTION:

A general purpose portable unit which contains an FM test set, a spectrum analyzer, and a simplified synchroscope. The equipment is designed to measure RF power output, frequency, and sensitivity, and to visibly display and measure frequencies of radar pulse spectra components. It is used to measure radar receiver local oscillator frequency, bandwidth, sensitivity, and radar recovery time. It is also used to tune radar oscillators; to make performance tests on and tune duplexers, AFC systems, and rotating joints; to visually examine the spectra of magnetrons, local oscillators, and test sets; and to investigate magnetron pulling.

RELATIONSHIP TO OTHER EQUIPMENT:

	AIR FORCE	NAVY	ARMY
TYPE CLASS.			
STOCK NOS.			
PROCUREM'T INFO.:			
PROCUREM'T COG.: USN		DESIGN COG.: USN, BuAer	
F.I.I.N.:		FUNCTIONAL CLASS. NO.: 10.1.3	
	- Electronics Test Equipment -		AN/UPM-14

This project was supported by the USAF on Contract AF 33(600)28276 and monitored by WADC, ARDC - Carl L. Frederick, Bethesda, Md. - Multilithed in U. S.

RADAR TEST SET AN/UPM-14

ELECTROMECHANICAL DESCRIPTION:

Circuit Information: The FM test set consists of a temperature compensated, thermistor bridge wattmeter and a signal generator. The signal generator furnishes continuous wave and frequency modulated test signals at accurately established frequency and power levels. The wattmeter measures externally generated power in decibels and milliwatts. The spectrum analyzer and synchroscope make possible the visible display of power versus frequency spectra of pulsed frequency signal on a three-inch cathode ray tube.

Power Supply: 103.5 to 126.5 volts, AC, 50 to 1000 cycles per second, single-phase, 300 watts.

Characteristics of FM Test Function:

- Frequency: Range: 34,000 to 35,600 megacycles per second.
    - Absolute Accuracy: ±10 megacycles per second at 25°C. (77°F.) and 60% relative humidity.
        - ±20 megacycles per second at -20°C. (-4°F.) to +40°C. (104°F.) and 0 to 95% relative humidity.
    - Accuracy with individual calibration curve: ±10 megacycles per second at -40°C. (-40°F.) to +55°C. (131°F.) and 0 to 95% relative humidity.
- Power:
    - Input: +9 to +30 dbm at input connector. Accuracy: ±2 decibels.
    - Output: -50 to -100 dbm at output connection. (Higher uncalibrated levels are available depending upon individual klystron tubes.)
- Frequency Modulation: Sweep Duration: 6 to 60 megacycles per second.
    - Phase Range: 2 to 50 microseconds after triggering.
    - Repetition Rate: 400 to 4000 cycles per second.
    - Amplitude: 0 to 240 volts.
    - Slope: 0 to 2.0 volts per microsecond.
- Triggers for Sawtooth Sweep Generator:
    - Internal RF Trigger: 50 to 500 watts peak, 0.1 to 10 microsecond pulses; recurrence rate of 400 to 4000 pulses per second.
    - External Video Trigger: +10 to +50 volts peak, 0.1 to 2 microsecond pulses; recurrence rate of 400 to 4000 pulses per second.

Characteristics of Spectrum Analyzer Function:

- Tuning Range: 34,000 to 35,600 megacycles per second.
- Spectrum Sweep Rate: 10 to 30 cycles per second, 0 to 170 volts.
- RF Sensitivity: -60 dbm for one-inch deflection on CRT.
- RF Attenuator: 9 to 50 decibels.
- IF Attenuator Control: 25 decibels.
- IF Bandwidth: 100 kilocycles per second ±10 kilocycles per second.
- Pulse Width Range: 0.1 to 2 microseconds.
- Sweep Synchronization: Equal to and synchronized with sub-multiples of line frequency.

(Continued)

ELECTROMECHANICAL DESCRIPTION: (Continued)

Characteristics of Synchroscope Function:

Deflection Sensitivity: 30 volts per half inch.

Sweep Speeds: 5, 15, and 40 microseconds.

Pulse Duration: 0.25 to 25 microseconds.

Video Amplifier Bandwidth: 4 megacycles per second.

Triggers Required:

Internal RF Trigger: 50 to 500 watts peak, 0.1 to 10 microsecond pulses; recurrence rate of 400 to 4000 cycles per second.

External Video Trigger: +10 to +50 volts, peak, 0.1 to 2 microsecond pulses; recurrence rate of 400 to 4000 cycles per second.

MANUFACTURERS' OR CONTRACTORS' DATA:

Sperry Gyroscope Company, Division of the Sperry Corporation, Great Neck, Long Island, New York; Contract Nos. NOas-9718, NOas 51-416C, NOas-54-826C, DA36-039SC-42516, AF 33(600)27852, (PO86-A-87784, PO86-A-87233 and PO86-B-1472).

TUBE COMPLEMENT:

1 JAN-OA2, 1 JAN-122, 1 JAN-3KP1, 1 JAN-5R4GY, 1 JAN-5Y3GT, 1 JAN-6AH6, 1 JAN-6AN5, 1 JAN-6AU6, 1 JAN-6D4, 1 JAN-6J4, 1 JAN-6Y6G, 2 JAN-12AT7, 3 JAN-5651, 1 JAN-5687, 2 JAN-5749, 5 JAN-5751, 4 JAN-5814, 2 JAN-5932, 1 JAN-6005, 1 JAN-5RV-38, 3 JAN-6AK5W, 1 JAN-6AL5.

REFERENCE DATA AND LITERATURE:

SHIPPING DATA:

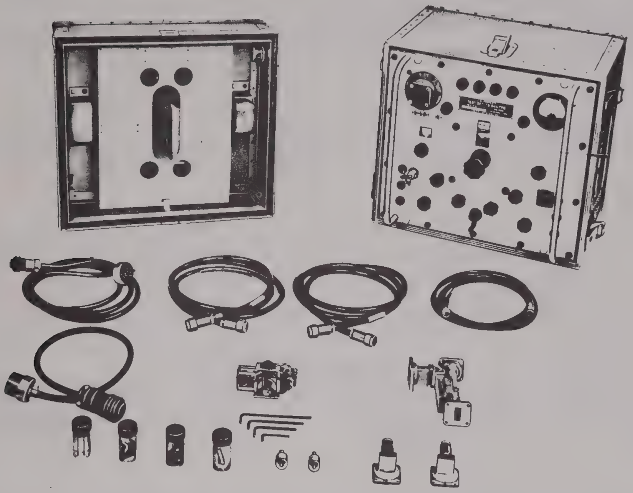
No. of Boxes	Contents & Identification	Volume (Cu. Ft.)	Over-all Dimensions (inches)			Weight Packed (Lbs.)
			H	W	D	
1	Radar Test Set AN/UPM-14		27	25	27	172

RADAR TEST SET AN/UPM-14

EQUIPMENT SUPPLIED:

Quant. Per Eq'pt	Name and Nomenclature	Case Mat'l	Stock Numbers (USAF) (Navy) (Army)	Overall Dimensions (inches)			Weight (Lbs.)
				H	W	D	
1	Radar Test Set AN/UPM-14			17-3/4	14-3/4	14-3/4	70
1	Carrying Case	Aluminum		18-5/8	18-5/8	19-3/4	32
2	Cord CG-409/U						
1	Cord CX-337/U						
1	Test Antenna AT-159/U						
2	Flexible Waveguide Assembly						
2	Waveguide Adapter						

RADAR TEST SET AN/UPM-25



UNCTIONAL DESCRIPTION:

A portable, general purpose unit designed for field or laboratory measurements radar equipment. It is used to measure radar transmitter frequency, power out- t and spectrum, radar receiver sensitivity, frequency, bandwidth and recovery me; it is also used to check magnetron pulling, AFC tracking, and AFC discrimi - tor alignment. The frequency dial is calibrated 843 to 966. To obtain frequency megacycles per second, multiply dial reading by ten. All controls and dials are cated on the front panel. The test set cabinet is pressurized, and contains two lves that tend to keep it at a constant pressure of not more than three pounds above below the pressure of the surrounding air.

ELATIONSHIP TO OTHER EQUIPMENT:

Similar to Test Set TS-147/UP.

LECTROMECHANICAL DESCRIPTION:

rcuit Information: Consists of a sawtooth wave generator, a radio frequency

(Continued)

	AIR FORCE	NAVY	ARMY
YPE CLASS.	Standard		
TOCK NOS.	7CAC-801319-215986		
ROCUREM'T INFO.:	USAF Spec. 7483-B; RADC Exhibit ENG-324 dtd 20 Feb.52		
ROCUREM'T COG.:	USAF	DESIGN COG.:	USAF, Rome
.I.I.N.:		FUNCTIONAL CLASS. NO.:	10.1.3
	- Electronics Test Equipment -		AN/UPM-25

roject was supported by the USAF on Contract AF 33(600)28276 and monitored by WADC, ARDC - Carl L. Frederick, Bethesda, Md. - Multilithed in U.S.A.

RADAR TEST SET AN/UPM-25

ELECTROMECHANICAL DESCRIPTION: (Continued)

oscillator with plumbing, a radio frequency power level bridge, a frequency meter, a radio frequency power level monitoring meter, a calibrated attenuator, an uncalibrated attenuator, a directional coupler assembly, a regulated power supply, and a trigger sign inverter.

Power Supply: 110 volts ±10%, AC, 50 to 1600 cycles per second, single phase, 70 watts.

Frequency Meter:
- Range: 8500 to 9500 megacycles per second.
- Absolute Accuracy: ±2.0 megacycles at 25° C. by use of calibration chart.

Power Meter:
- Input Signals:
  - Range: +20 to +75 dbm without external 25 decibels directional coupler.
  - Accuracy: ±1 decibel at 25° C. and 60% relative humidity; ±2 decibels over entire temperature and humidity range.

RF Oscillator:
- Tuning Range: 8500 to 9600 megacycles per second.
- Frequency Modulation: The oscillator is capable of being frequency modulated at 60 megacycles per second when a sawtooth wave of approximately 20 volts peak to peak amplitude is applied.
- Output Signals:
  - Range: -40 to -90 dbm without external directional coupler.
  - Accuracy: ±1 decibel at 25° C. and 60% relative humidity; ±2 decibels over entire temperature and humidity range.

Calibrated DBM Attenuator:
- Range: 0 to 50 decibels attenuation.
- Accuracy: ±0.5 decibel.
- Insertion Loss: Maximum not exceeding 0.7 decibel.

Internal Directional Coupler:
- Input Signal Attenuation: 20 decibels, ±1 decibel.
- Output Signal Attenuation: 40 decibels, ±1 decibel.

External Directional Coupler:
- Attenuation: 25 decibels, ±1 decibel, over range of 8500 to 9500 megacycles per second.

MANUFACTURERS' OR CONTRACTORS' DATA:

Espey Manufacturing Company, Incorporated, New York, New York; Contract AF 33(038)7949, dated 29 June 1949; Approximate Cost per Unit, $2,500.00.

TUBE COMPLEMENT:

1 JAN-5R4WGY, 3 JAN-OD3, 1 JAN-6SN7, 1 JAN-2K25, 1 JAN-884.

REFERENCE DATA AND LITERATURE:

TO 16-35TS541-2 (Operation and Service Instructions).
TO 16-35TS541-3 (Maintenance Instructions).
TO 16-35TS541-4 (Parts Catalog).

RADAR TEST SET AN/UPM-25

SHIPPING DATA:

No. of Boxes	Contents & Identification	Volume (Cu. Ft.)	Overall Dimensions (inches)			Weight Packed (Lbs.)
			H	W	D	

EQUIPMENT SUPPLIED:

Quant. Per Eq'pt	Name and Nomenclature	Case Mat'l	Stock Numbers (USAF) (Navy) (Army)	Overall Dimensions (inches)			Weight (Lbs.)
				H	W	D	
1	Test Set, Radar AN/UPM-25 Including:		7CAC-801319-215986				
1	Test Set TS-541/TPS	Aluminum	7CAC-801319-226 3F4325-541	13-1/2	15-3/4	14-1/2	55.25
1	Test Set Case CY-1083/UPM-25	Plywood		17-3/4	18-3/4	16-1/2	34.00
2	Cord CG-92A/U		7CAC-170265-425 1F430-92.72	72 long			
1	Cord CG-426/U			96 long			
1	Coaxial to Waveguide Adapter UG-687/U						
1	Coaxial to Waveguide Adapter UG-688/U						
1	Adapter UG-201/U		8850-101950 2Z308-201				
1	Adapter UG-273/U		8850-102000 2Z308-273				

(Continued)

RADAR TEST SET AN/UPM-25

EQUIPMENT SUPPLIED: (Continued)

Quant. Per Eq'pt	Name and Nomenclature	Case Mat'l	Stock Numbers (USAF) (Navy) (Army)	Over-all Dimensions (inches)			Weight (Lbs.)
				H	W	D	
1	Directional Coupler UG-689/UPM-25						
1	Electrical Power Cable Assembly CX-1909/U						
1	Electrical Power Cable Assembly CX-1910/U						
1	Resistor Assembly CN-170/UPM-25						
1	Operating Spares						

RADAR TEST SET AN/UPM-44

TS-768/UPM-44

FUNCTIONAL DESCRIPTION:

A portable, general purpose, combination test equipment which combines in one unit the functions of a signal generator, a power frequency meter, a spectrum analyzer, and a synchroscope. It is used to test either single-pulse or multi-pulse radar systems. The general applications of the test set include the following: (a) measurement of radar transmitter power and frequency; (b) measurement of radar receiver, bandwidth, sensitivity, recovery time, and local oscillator frequency; (c) tuning of radar local oscillators; (d) performance testing and/or tuning of duplexers, AFC systems, rotating joints, etc.; (e) visual examination of the spectra of magnetrons, local oscillators, and test sets; (f) investigation of magnetron pulling.

RELATIONSHIP TO OTHER EQUIPMENT:

Similar to Sperry Model 590 Combination Test Set.

ELECTROMECHANICAL DESCRIPTION:

Circuit Information: With the function switch in the transmitter testing (TRAN) position, power measurements are made on input signals. The input signals pass through a microwave section to a temperature-compensated, thermistor wattmeter bridge. A calibrated dbm attenuator in the microwave section is used in

(Continued)

	AIR FORCE	NAVY	ARMY
TYPE CLASS.			
STOCK NOS.			
PROCUREM'T INFO.: Spec. MIL-T-18133 (Aer) dtd 22 July 1954			
PROCUREM'T COG.: USN	DESIGN COG.: USN, BuAer		
F.I.I.N.:	FUNCTIONAL CLASS. NO.: 10.1.3		
- Electronics Test Equipment -			AN/UPM-44

This project was supported by the USAF on Contract AF 33(600)28276 and monitored by WADC, ARDC - Carl L. Frederick, Bethesda, Md. - Multilithed in U. S. A.

ELECTROMECHANICAL DESCRIPTION: (Continued)

conjunction with the wattmeter bridge and indicating meter to obtain direct power-level readings in decibels relative to one milliwatt. In the TRAN position the test set may also be used as a synchroscope. The incoming video signal passes through the video amplifier to the vertical deflection circuit of the cathode ray tube. The trigger amplifier output controls the synchroscope sweep generator which in turn provides the horizontal deflection voltage for the cathode ray tube.

The function served when the selector switch is in the test set adjustment (MIXER) position is the testing or adjusting of the RF oscillator. The spectrum sweep generator provides horizontal deflection voltage. This voltage is applied to the reflector of the RF oscillator to frequency modulate the klystron in synchronism with the horizontal sweep. The klystron signal then goes to the mixer where it is rectified. The rectified signal is smoothed by a filter and the resulting envelope goes through the mode amplifier to feed the vertical deflection system of the cathode ray tube.

The function of the spectrum analyzer (SPECT) position is spectrum observation. The input signal and the frequency modulated klystron oscillator signal are mixed to produce heterodyne frequencies which are fed to an IF amplifier. The IF amplifier amplitude discriminates and square law detects the signal to obtain an output proportional to frequency rather than voltage. This signal and the differentiated mode amplifier signal are fed through the vertical amplifier and produce a pattern of a frequency vs power spectrum with the frequency meter pip superimposed on the baseline for easy identification of the frequency components. For multi-pulsed systems, a special gating circuit can be switched into operation to select any desired pulse in the radar repetition interval.

The receiver testing (RECV) position causes an FM or CW signal to be developed. Both the frequency and power level of this signal are known. The receiver testing (TEST) position is similar to RECV position except that a high-level output test signal is provided. This is accomplished by switching the step attenuator out of the electrostatic field.

Power Supply: 103.5 to 126.5 volts, AC, 50 to 1000 cycles per second, single-phase, 250 watts.

Power Meter:
  Frequency Range: 2700 to 3550 megacycles per second.
  Power Input:
    Range: +5 to +30 dbm at input connector.
    Accuracy: ±3 decibels from dial (-20°C. (-4°F.) +40°C. (+104°F.)), ±1 decibel from correction chart.

Frequency Meter:
  Frequency Range: 2700 to 3550 megacycles per second.
  Absolute Accuracy: ±3 megacycles, 2700 to 3550 megacycles at +25°C. (+77°F.); ±1 megacycle, 2700 to 3550 megacycles with correction charts, at +25°C. (+77°F.).
  Relative Accuracy: ±1 megacycle over any 60-megacycle interval.

ELECTROMECHANICAL DESCRIPTION: (Continued)

Spectrum Analyzer:

Tuning Range: 2700 to 3550 megacycles per second.

Sweep Speeds: 5 to 30 cycles per second, adjustable.

RF Attenuator Range: 0 to 50 decibels (can be extended by the use of external attenuator pads).

RF Sensitivity: -65 dbm for a one-inch deflection on cathode ray tube.

IF Gain Control: 30 decibels.

Pulse Width (normal): 0.2 to 3 microseconds.

Sweep Synchronization: Subharmonics of line frequency.

IF Bandwidth: 50 to 60 kilocycles per second.

Stability and Jitter: 1/32 inch at maximum sensitivity.

Pulse Width (gated): 0.2 to 1.75 microseconds.

Maximum Pulse Separation: 50 microseconds, first to last pulse.

Minimum Pulse Separation: 0.25 microsecond, trailing to leading edge.

Gating Trigger: +10 to +50 volts peak, 0.25 to 10 microseconds duration, repetition rates of 100 to 4000 cycles per second, preceeding first radar pulse by one microsecond minimum.

Synchroscope:

Deflection Sensitivity: 2 volts/inch.

Sweep Speeds: 5, 40, 150, 1000 or 3000 microseconds.

RF Trigger: 50 to 1000 watts peak, 0.25 to 10 microseconds duration, repetition rates of 100 to 4000 cycles per second, average power not to exceed one watt.

Video Trigger: +10 to +50 volts peak, 0.25 to 10 microseconds duration, repetition rates of 100 to 4000 cycles per second.

Video Amplifier Gain: 30 decibels.

Video Amplifier Bandwidth: 500 kilocycles to 8 megacycles per second.

Input Impedance: 180 ohms shunted by 30 micromicrofarads.

Pulse Length: 0.25 to 10 microseconds.

Pulse Amplitude: 1 to 50 volts, positive or negative.

Signal Generator:

Power Output Range:

Calibrated: -5 to -100 dbm.

Uncalibrated: +3 to -5 dbm.

Accuracy: ±3 decibels from dial, ±1 decibel from correction chart.

Frequency Modulation:

Frequency Deviation of Sweep: 0 to 20 megacycles minimum.

Phase Range: 3 to 50 microseconds after triggering.

Repetition Rate Range: 100 to 4000 cycles per second.

Trigger Amplifier Gain: 1000.

RF Trigger: 50 to 1000 watts peak, 0.25 to 10 microseconds duration, repetition rates of 100 to 4000 cycles per second, average power not to exceed one watt.

ELECTROMECHANICAL DESCRIPTION: (Continued)

Video Trigger: +10 to +50 volts peak, 0.25 to 10 microseconds duration, repetition rates of 100 to 4000 cycles per second.

External Pulse Modulation: 0.2 to 125 microseconds pulse width, repetition rates of 100 to 4000 cycles per second, 40 volts positive minimum.

TUBE COMPLEMENT:

3 JAN-OA2, 1 JAN-1Z2, 1 JAN-2D21W, 1 JAN-3KP1, 1 JAN-5R4GY, 1 JAN-6AG5, 3 JAN-6AH6, 2 JAN-6AN5, 1 JAN-6AS6, 1 JAN-6AU6, 1 JAN-6D4, 1 JAN-6X4W, 2 JAN-12AT7, 1 JAN-726C, 1 JAN-5651, 4 JAN-5654, 1 JAN-5687, 4 JAN-5751, 5 JAN-5814, 1 JAN-6080, 2 JAN-1N23B, 1-CR201.

MANUFACTURERS' OR CONTRACTORS' DATA:

Sperry Gyroscope Company, Great Neck, Long Island, New York; Navy Contract No. NOas 54-668.

REFERENCE DATA AND LITERATURE:

Handbook of Maintenance Instructions.

SHIPPING DATA:

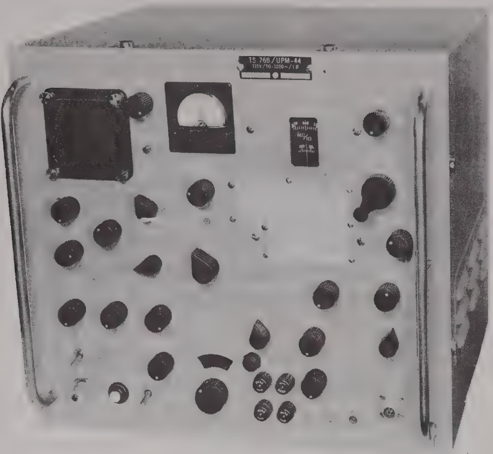
No. of Boxes	Contents & Identification	Volume (Cu. Ft.)	Overall Dimensions (inches)			Weight Packed (Lbs.)
			H	W	D	

RADAR TEST SET AN/UPM-44

EQUIPMENT SUPPLIED:

Quant. Per Eq'pt	Name and Nomenclature	Case Mat'l	Stock Numbers (USAF) (Navy) (Army)	Overall Dimensions (inches)			Weight (Lbs.)
				H	W	D	
1	Radar Test Set AN/UPM-44						
	Including:						
1	Radar Test Set TS-768/UPM-44			16-3/4	18-1/4	16-1/4	75
1	Transit Case CY-1331/UPM-44			21-1/8	19-5/16	21	30
2	Video Cable Assy. CG-409/U			96 long			0.5
1	Power Cord Assy. CX-3277/U			96 long			0.813
1	Output Cable Assy. CG-92A/U			96 long			1.25
1	Adapter (UHF to BNC) UG-255/U			1-3/8	5/8		0.125
4	Klystron						
3	Crystal Rectifier 1N23B			13/16	5/16		
1	Thermistor Cartridge and Resistor Assy.						
5	Cartridge Fuse			1-1/4	1/4		
9	Lamp						
8	Gasket			7/8	1/32		
3	Allen Wrench			2			
1	Directive Antenna AS-23/AP			3-13/16	2	1-3/16	0.22

RADAR TEST SET AN/UPM-44(XN-1)



FUNCTIONAL DESCRIPTION:

A portable, general purpose, combination test equipment which combines in one unit the functions of an FM test set, a spectrum analyzer, and a synchroscope. It is used to test either single-pulse or multi-pulse radar systems. The general applications of the test set include the following: (a) measurement of radar transmitter power and frequency; (b) measurement of radar receiver local oscillator frequency, bandwidth, sensitivity, and radar recovery time; (c) tuning of radar local oscillators; (d) performance testing and/or tuning of duplexers, AFC systems, rotating joints, etc.; (e) visual examination of the spectra of magnetrons, local oscillators and test sets; (f) investigation of magnetron pulling.

RELATIONSHIP TO OTHER EQUIPMENT:

ELECTROMECHANICAL DESCRIPTION:

Circuit Information: This test set is a combination RF wattmeter, frequency meter, spectrum analyzer, RF signal generator, and synchroscope.

With the function switch in the transmitter testing (TRAN) position, power measurements are made on input signals. The input signals pass thru a microwave section to a temperature-compensated, thermistor wattmeter bridge. A calibrated dbm attenuator in the microwave section is used in conjunction with the wattmeter bridge and indicating meter to obtain direct power-level readings in decibels relative to one milliwatt. In the TRAN position the test set may also

(Continued)

	AIR FORCE	NAVY	ARMY
TYPE CLASS.			
STOCK NOS.			
PROCUREM'T INFO.: Spec. MIL-T-18133 (Aer) dtd 22 July 1954			
PROCUREM'T COG.: Navy	DESIGN COG.: Navy, BuAer		
F.I.I.N.:	FUNCTIONAL CLASS. NO.: 10.1.3		
- Electronics Test Equipment -	AN/UPM-44(XN-1)		

his project was supported by the USAF on Contract AF 33(600)28276 and monitored by WADC, ARDC - Carl L. Frederick, Bethesda, Md. - Multilithed in U. S. A.

ELECTROMECHANICAL DESCRIPTION: (Continued)

be used as a synchroscope. The incoming video signal, passes through the video amplifier to the vertical deflection circuit of the cathode ray tube. The trigger amplifier output controls the synchroscope sweep generator which in turn provides the horizontal deflection voltage for the cathode ray tube.

The function served when the selector switch is in the test set adjustment (MIXER) position is the testing or adjusting of the RF oscillator. The spectrum sweep generator provides horizontal deflection voltage. This voltage is applied to the reflector of the RF oscillator to frequency modulate the klystron in synchronism with the horizontal sweep. The klystron signal then goes to the mixer where it is rectified. The rectified signal is smoothed by a filter and the resulting envelope goes through the mode amplifier to feed the vertical deflection system of the cathode ray tube.

The function of the spectrum analyzer (SPECT) position is spectrum observation. The input signal and the frequency modulated klystron oscillator signal are mixed to produce heterodyne frequencies which are fed to an IF amplifier. The IF amplifier amplitude discriminates and square law detects the signal to obtain an output proportional to frequency rather than voltage. This signal and the differentiated mode amplifier signal are fed through the vertical amplifier and produce a pattern of a frequency vs power spectrum with the frequency meter pip superimposed on the baseline for easy identification of the frequency components. For multi-pulsed systems, a special gating circuit can be switched into operation to select any desired pulse in the radar repetition interval.

The receiver testing (RECV) position causes an FM or CW signal to be developed. Both the frequency and power level of this signal are known. The receiver testing (TEST) position is similar to RECV position except that a high-level output test signal is provided. This is accomplished by switching the step attenuator out of the electrostatic field.

Power Supply: 103.5 to 126.5 volts, AC, 50 to 1000 cycles per second, single-phase, 210 watts.

FM Test Set:

Frequency Range: 2700 to 3550 megacycles per second.

Absolute Accuracy:

±3 megacycles per second, 2700 to 3550 megacycles at 25°C. (77°F.).

±1.5 megacycles per second, 2700 to 3000 megacycles at 25°C. (77°F.).

Relative Accuracy: ±1 megacycle per second over any 60 megacycle per second interval.

Power Input:

Range: +5 to +30 dbm at input connector.

Accuracy: ±1 decibel with correction chart.

Power Output:

Range (calibrated): -5 to -55 dbm (TEST).
-50 to -100 dbm (RECV).

Accuracy: ±1 decibel (RECV, with correction chart).

Frequency Modulation:

Frequency deviation of sweep: 0 to 3 megacycles per second minimum.

(Continued)

RADAR TEST SET AN/UPM-44(XN-1)

ELECTROMECHANICAL DESCRIPTION: (Continued)

Phase range: 3 to 50 microseconds after triggering.

Repetition rate range: 100 to 4000 cycles per second.

Trigger amplifier gain: 500.

Trigger Characteristics for Modulation (Sawtooth) Sweep Generator:

RF trigger: 50 to 500 watts peak; 0.2 to 10 microseconds duration; repetition rates of 100 to 4000 cycles per second.

Video trigger: +10 to +50 volts peak; 0.1 to 10 microseconds duration; repetition rates of 100 to 4000 cycles per second.

External Modulation: 0.2 to 10 microseconds pulse width; repetition rates of 100 to 4000 cycles per second, 400 volts positive.

Spectrum Analyzer Characteristics:

Tuning Range: 2700 to 3550 megacycles per second.

Sweep Speeds: 5 to 30 cycles per second, adjustable.

RF Attenuator Range: 50 decibels.

RF Sensitivity: 70 dbm for one-inch deflection on CRT.

IF Gain Control: 30 decibels.

Pulse Width: 0.2 to 3 microseconds.

Sweep Synchronization: At line frequency or subharmonics of line frequency.

IF Bandwidth: 55 kilocycles per second.

Stability and Jitter: 1/32 inch at maximum sensitivity.

Gating Trigger:

Amplitude: 200 volts (negative).

Timing: One microsecond minimum before first radar pulse.

Synchroscope Characteristics:

Deflection Sensitivity: 2 volts per inch.

Sweep Speeds: 5, 40, 150, 1000, and 3000 microseconds.

Trigger Required: As specified under FM test set characteristics.

Pulse Observable: 0.125 microsecond duration.

Video Amplifier Gain: 30 decibels.

Video Amplifier Bandwidth: 8 megacycles per second.

Meters: Ammeter: 0 to 2 watts; accuracy, ±2% of full scale.

TUBE COMPLEMENT:

3 JAN-OA2, 1 JAN-1Z2, 1 JAN-2D21W, 1 JAN-3KP1, 1 JAN-5R4GY, 1 JAN-6AG5, 3 JAN-6AH6, 2 JAN-6AN5, 1 JAN-6AS6, 1 JAN-6AU6, 1 JAN-6D4, 1 JAN-6X4W, 2 JAN-12AT7, 1 JAN-726C, 1 JAN-5651, 4 JAN-5654, 1 JAN-5687, 4 JAN-5751, 5 JAN-5814, 1 JAN-6080, 2 JAN-1N23B, 1-CR201.

MANUFACTURERS' OR CONTRACTORS' DATA:

Sperry Gyroscope Company, Great Neck, Long Island, New York; Contract No. NOas53-735c.

REFERENCE DATA AND LITERATURE:

Handbook of Maintenance Instructions.

RADAR TEST SET AN/UPM-44(XN-1)

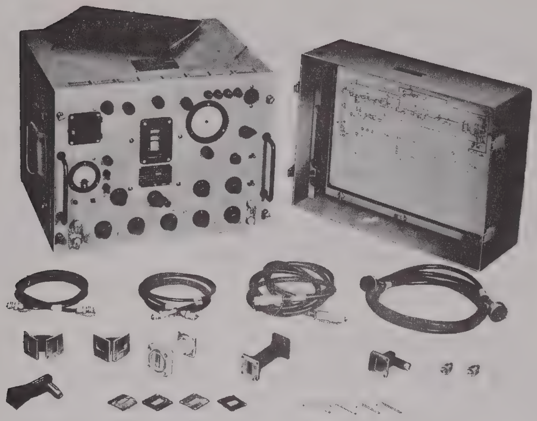
SHIPPING DATA:

No. of Boxes	Contents & Identification	Volume (Cu. Ft.)	Overall Dimensions (inches)			Weight Packed (Lbs.)
			H	W	D	

EQUIPMENT SUPPLIED:

Quant. Per Eq'pt	Name and Nomenclature	Case Mat'l	Stock Numbers (USAF) (Navy) (Army)	Over-all Dimensions (inches)			Weight (Lbs.)
				H	W	D	
1	Radar Test Set AN/UPM-44 (XN-1)						
	Including:						
1	Radar Test Set TS-768(XN-1)			16-3/4	18-1/4	16-1/4	77
1	Transit Case CY-133(XN-1)/ UPM-44			28-1/8	19-5/16	21	42
2	Video Cable Assy CG-409/U			96 long			0.5
1	Power Cord Assy. CX-337/U			72 long			0.813
1	Output Cable Assy. CG-92A/U			96 long			1.25
1	Directive Antenna AS-23/AP			3-13/16	2	1-3/16	0.22
1	Adapter (UHF to BNC) UG-25/U			1-3/8	5/8		0.125
3	Crystal Rectifier 1N23B			13/16	5/16		
1	Thermistor Cartridge Assy.			13/16	3/16		
1	Resistor Assy.			1/2	1/4		
5	Cartridge Fuse			1-1/4	1/4		
3	Lamp						
8	Gasket			7/8	1/32		
1	Gasket			7/8	1/8		
1	Hex. Socket Screw Wrench			2			

RADAR TEST SET AN/UPM-56



FUNCTIONAL DESCRIPTION:

A portable precision microwave signal generator, power meter, and frequency meter designed to test and adjust radar, beacon, and associated equipment. The equipment can be used as a continuous wave, frequency modulated, or pulse modulated signal generator.

RELATIONSHIP TO OTHER EQUIPMENT:

Overall nomenclature for Radar Test Set TS-642/U.

ELECTROMECHANICAL DESCRIPTION:

Circuit Information: Pulse modulation is obtained from a pulse generator within the test set. The pulsed RF signals are used for receiver tuning and measurements of receiver sensitivity, radar range, and TR recovery time. Frequency modulation is obtained from a sawtooth sweep generator within the test set. FM output is used with an oscilloscope for receiver frequency and bandwidth measurements. The continuous wave output is used to measure receiver sensitivity and frequency. A square wave output, with a repetition rate of about 1000 pulses per second, is used for impedance, standing wave, and similar measurements with a slotted line.

(Continued)

	AIR FORCE	NAVY	ARMY
TYPE CLASS.			
STOCK NOS.			
PROCUREM'T INFO.:			
PROCUREM'T COG.: USN	DESIGN COG.: USN, BuShips		
F.I.I.N.:	FUNCTIONAL CLASS. NO.: 10.1.3		
- Electronics Test Equipment -			AN/UPM-56

his project was supported by the USAF on Contract AF 33(600)28276 and monitored by WADC, ARDC - Carl L. Frederick, Bethesda, Md. - Multilithed in U. S. A.

ELECTROMECHANICAL DESCRIPTION: (Continued)

Power Supply: 115 volts, ±10%, AC, 50 to 1000 cycles per second, single-phase, 350 watts.

Power Meter:
- Frequency Range: 8500 to 9600 megacycles per second.
- Power Range: 1 to 30 dbm.
- Accuracy: ±1.5 decibels.

Frequency Meter:
- Frequency Range: 8500 to 9600 megacycles per second.
- Absolute Accuracy: ±1 megacycle per second.
- Calibration Points: 8500 megacycles per second, ±1/2 megacycle per second;
  9310 megacycles per second, ±1/2 megacycle per second;
  9600 megacycles per second, ±1/2 megacycle per second.

Signal Generator:
- Frequency Range: 8500 to 9600 megacycles per second.
- Power Range: -1 to -105 dbm (average) in three steps; -1 to -36 dbm, -36 to -71 dbm, -71 to -106 dbm.
- Stability: Less than 1 megacycle per second frequency drift in a 60-minute interval.
- Output Signal Characteristics:
  - Continuous Wave: Can be continuously tuned throughout the frequency range.
  - Pulse Modulation:
    - 1.0 ±0.1 microsecond, fixed duration.
    - 2.35 microseconds ±0.1 microsecond, fixed duration.
    - 0.2 microsecond to 10 microseconds, continuously variable duration.
    - 100 to 50,000 pulses per second, repetition rate.
    - 1000 pulses per second, ±20%, square wave.
    - 0.1 microsecond, rise time.
    - 0.1 microsecond, decay time.
    - Continuously variable pulse delay.
  - Frequency Modulation:
    - 8500 to 9600 megacycles per second.
    - 0.02 to over 25 megacycles per microsecond, sweep rate.
    - Less than 1 microsecond, delay time.
    - At least 25 megacycles per second, frequency excursion.
    - Approximately 100 to 300,000 sweeps per second, internal synchronization.
  - Input Trigger Requirement:
    - Video or RF trigger.
    - Greater than 1 microsecond duration.
    - Less than 2 microseconds rise time.
    - More than 10 volts or 5 watts peak.
    - 100 to 50,000 pulses per second.
    - 52 ohms RF input impedance, 75 ohms video input impedance.

(Continued)

RADAR TEST SET AN/UPM-56

ELECTROMECHANICAL DESCRIPTION: (Continued)

Trigger Generator:

± polarity.
0.5 microsecond to 5 microseconds, duration.
Less than 0.1 microsecond, rise time.
Less than 0.5 microsecond, decay time.
25 to 50 volts, peak across 75 ohms.
100 to 50,000 pulses per second repetition rate.

MANUFACTURERS' OR CONTRACTORS' DATA:

General Communication Company, 681 Beacon Street, Boston 15, Massachusetts; Type No. P244; Contract Nos. NObsr 43172, dated 28 January 1949 and NObsr 52261, dated 19 February 1951.

TUBE COMPLEMENT:

3 JAN-OA2, 8 JAN-12AT7, 1 JAN-2K25, 1 JAN-5687, 1 JAN-5814, 2 JAN-6AH6, 2 JAN-6AN5, 9 JAN-6AQ5, 3 JAN-6AU6, 2 JAN-6AX4GT, 4 JAN-6X4, 12-CK705 (Raytheon), 1 JAN-1N23B.

REFERENCE DATA AND LITERATURE:

NAVSHIPS 92064 (Instruction Book).

SHIPPING DATA:

No. of Boxes	Contents & Identification	Volume (Cu. Ft.)	Overall Dimensions (inches)			Weight Packed (Lbs.)
			H	W	D	
1	Radar Test Set AN/UPM-56	8.0	19-3/4	25-1/4	27-3/4	201

EQUIPMENT SUPPLIED:

Quant. Per Eq'pt	Name and Nomenclature	Case Mat'l	Stock Numbers (USAF) (Navy) (Army)	Overall Dimensions (inches)			Weight (Lbs.)
				H	W	D	
1	Radar Test Set AN/UPM-56			15-1/8	19-11/16	22	124
	Including:						
1	Radar Test Set TS-642/U						

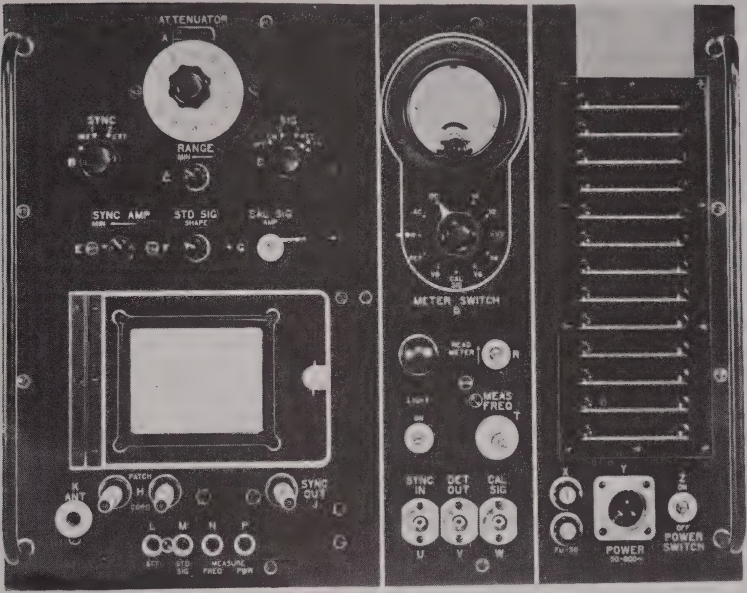
(Continued)

RADAR TEST SET AN/UPM-56

EQUIPMENT SUPPLIED: (Continued)

Quant. Per Eq'pt	Name and Nomenclature	Case Mat'l	Stock Numbers (USAF) (Navy) (Army)	Over-all Dimensions (inches)			Weight (Lbs.)
				H	W	D	
1	Test Set Case CY-1557/UPM-56						
2	RF Cable Assembly CG-530/U		2600-322931520	72 long			
1	RF Cable Assembly CG-92A/U		7CAC-170265-425	72 long			
1	Cable Assembly Power CX-337/U		7CAC-17026486	96 long			
1	Coaxial to Waveguide Adapter UG-446/U		N16-A-15630-7526				
1	Waveguide to Waveguide Adapter		N16-A-23031-7501				
1	Pickup Antenna AT-68/UP		7CAC-045705 N16-A-52545-1626				
2	Adapter BNC to UHF UG-273/U		8850-102000 N17-C-67988-5260				
1	E-plane bend Waveguide Elbow		N16-W-21991-1440				
1	H-plane bend Waveguide Elbow		N16-W-21991-1341				
1	Waveguide Extension		N16-W-21991-1343				
2	Instruction Book						
1	Set Repair Parts						

SIGNAL GENERATOR BC-1077-A
(GENERATOR, SIGNAL, BC-1077-A)


ATTENUATOR
A
SYNC
RANGE
MIN
SIG
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STD SIG
SHAPE
CAL SIG
AMP
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STD SIG
MEASURE
FREQ
PWR
SYNC IN
DET OUT
CAL SIG
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ON
OFF
POWER
POWER SWITCH

FUNCTIONAL DESCRIPTION:

A portable, general purpose test unit used to provide radio frequency pulses of known power and frequency for use in the testing of radar equipments. The output frequency and power are both calibrated. This test set contains a UHF cavity type oscillator, a pulser circuit, a frequency meter, a power measuring circuit, a calibrated attenuator and a power supply circuit.

RELATIONSHIP TO OTHER EQUIPMENT:

BC-1077-A is fundamentally the same as the production model BC-1277-A, except that the latter employs standard UHF connectors whereas the BC-1077-A uses H. B. Jones' jacks and plugs.

Similar to Bell Telephone Laboratories Model X-66121.

ELECTROMECHANICAL DESCRIPTION:

Power Supply: 115 volts ±10%, AC, single phase, 50 to 1200 cycles per second, 2 amperes approximately.

(Continued)

	AIR FORCE	NAVY	ARMY
TYPE CLASS.			
STOCK NOS.	7CAC-801319-2188		3F3900-1077A
PROCUREM'T INFO.: WE Co. Dwg. No. D-150637			
PROCUREM'T COG.: USAF		DESIGN COG.: USAF, C&N	
F.I.I.N.:		FUNCTIONAL CLASS. NO.: 10.1.3	
- Electronics Test Equipment -			BC-1077-A

is project was supported by the USAF on Contract AF 33(600)28276 and monitored by WADC, ARDC - Carl L. Frederick, Bethesda, Md. - Multilithed in U. S. A.

SIGNAL GENERATOR BC-1077-A
(GENERATOR, SIGNAL, BC-1077-A)

ELECTROMECHANICAL DESCRIPTION: (Continued)

Frequency Range: 2700 to 3400 megacycles per second.
Type of Transmission: Pulsed.
Power Output: -7 to -107 dbm, 6 milliwatts (maximum).
Power Input: +33 to +68 dbm input to attenuator.
Impedance: 72 ohms.
Pulse Repetition Rate: 500 pulses per second.
Pulse Width: 0.25 microseconds to 50 microseconds.
Pulse Delay: 0.25 to 50 microseconds after transmitted pulse has started when pulse width is set at 1 microsecond.
Accuracy: Frequency ±1 megacycle per second at beacon frequency (3253 megacycles per second) and ±2 megacycles over rest of range. Peak Power ±1.5 decibels; Average Power ±1.0 decibel.
Receiver Sensitivity: ±2 decibels.
Temperature Range: -40°F. to +120°F.
Relative Humidity Range: Up to 95%.
Barometric Pressure Range: 20.5 inches to 30 inches of mercury.

MANUFACTURERS' OR CONTRACTORS' DATA:

Western Electric Company, 120 Broadway, New York, New York; Contract No. 1349-WF-42; Contract No. 239-WF-42.

TUBE COMPLEMENT:

4 JAN-6AC7, 1 JAN-6L7, 1 JAN-1622, 1 JAN-5T4, 1 JAN-6ZY5G, 2 JAN-6Y6G, 2 JAN-6SF5, 4 JAN-OD3/VR150, 1 JAN-OC3/VR105, 1 JAN-707A.

REFERENCE DATA AND LITERATURE:

TO 16-55-68 (Spare Parts List).

SHIPPING DATA:

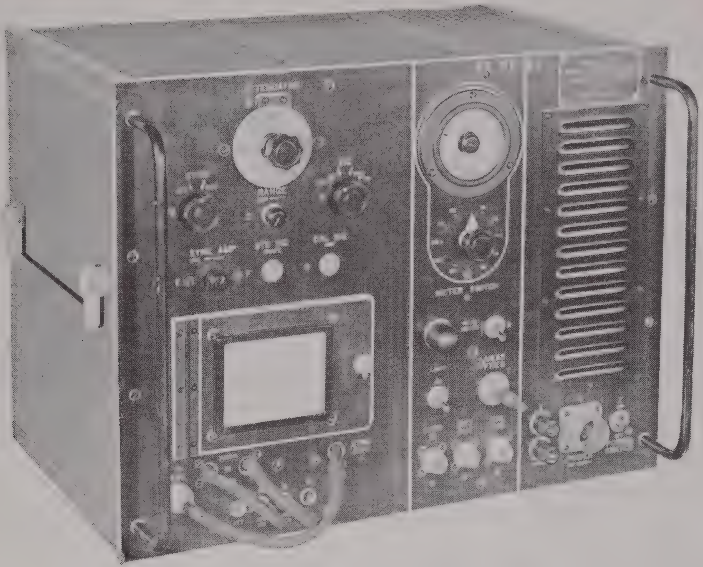
No. of Boxes	Contents & Identification	Volume (Cu. Ft.)	Over-all Dimensions (inches)			Weight Packed (Lbs.)
			H	W	D	
1	Signal Generator, BC-1077-A (Domestic Packed)	13.2	25-1/2	35-1/4	25-1/4	200

SIGNAL GENERATOR BC-1077-A
(GENERATOR, SIGNAL, BC-1077-A)

EQUIPMENT SUPPLIED:

Quant. Per Eq'pt	Name and Nomenclature	Case Mat'l	Stock Numbers (USAF) (Navy) (Army)	Over-all Dimensions (inches)			Weight (Lbs.)
				H	W	D	
1	Signal Generator BC-1077-A		7CAC-801319-2188 3E3900-1077A	14-7/8	18-11/16	11-1/8	72
1	Case			26-1/6	18-1/4	19-13/16	44
						Total:	116

SIGNAL GENERATOR BC-1277-A
(GENERATOR, SIGNAL, BC-1277-A)



FUNCTIONAL DESCRIPTION:

A portable, general purpose test unit used to provide radio frequency pulses of known power and frequency for use in the maintenance and adjustment of various radar equipments. The output frequency and power are both calibrated. This test set contains a UHF cavity type oscillator, a pulser circuit, a frequency meter, a power measuring circuit, a calibrated attenuator and a power supply circuit.

RELATIONSHIP TO OTHER EQUIPMENT:

BC-1277-A is fundamentally the same as the pre-production model BC-1077-A, except that the latter employs H. B. Jones' jacks and plugs whereas the BC-1277-A uses standard UHF connectors. Differences also exist on the beacon frequency calibrator, an improvement in attenuator design and a counter type micrometer dial.

Similar to Signal Generator used in Navy LZ Test Set.

	AIR FORCE	NAVY	ARMY
TYPE CLASS.			
STOCK NOS.			3F3840-1277A
PROCUREM'T INFO.:			
PROCUREM'T COG.:	USAF	DESIGN COG.:	USAF, C&N
F.I.I.N.:		FUNCTIONAL CLASS. NO.:	10.1.3
	- Electronics Test Equipment -		BC-1277-A

his project was supported by the USAF on Contract AF 33(600)28276 and monitored by WADC, ARDC - Carl L. Frederick, Bethesda, Md. - Multilithed in U. S. A.

SIGNAL GENERATOR BC-1277-A
(GENERATOR, SIGNAL, BC-1227-A)

ELECTROMECHANICAL DESCRIPTION:

Power Supply: 115 volts ±10%, AC, single phase, 50 to 1200 cycles per second, 2 amperes approximately.

Frequency Range: 2700 to 3400 megacycles per second.

Type of Transmission: Pulsed.

Power Output: -7 to -107 dbm, 6 milliwatts (maximum), CW or pulsed (2720 to 3333 megacycles).

Power Input: +33 to +68 dbm input to attenuator.

Impedance: 72 ohms.

Pulse Repetition Rate: 500 pulses per second.

Pulse Width: 0.5 microseconds to 50 microseconds.

Pulse Delay: 0.5 to 50 microseconds after transmitted pulse has started when pulse width is set at 1 microsecond.

Accuracy: Frequency ±1 megacycle per second at beacon frequency (3256 megacycles per second) and ±2 megacycles per second over rest of range. Peak Power ±1.5 decibels; Average Power ±1.0 decibel.

Receiver Sensitivity: +2 decibels.

Temperature Range: -40° F. to +120° F.

Relative Humidity Range: Up to 95%.

Barometric Pressure Range: 20.5 inches to 30 inches of mercury.

MANUFACTURERS' OR CONTRACTORS' DATA:

Western Electric Company, 120 Broadway, New York, New York; Contract No. 12162-43, 29 June 1943; Approximate Cost per Unit, $932.00; Contract No. 11766-43, 31 May 1943; Approximate Cost per Unit, $932.00; Contract No. 709-44, 31 May 1944; Approximate Cost per Unit, $843.60.

TUBE COMPLEMENT:

4 JAN-6AC7, 1 JAN-6L7, 1 JAN-1622, 1 JAN-5T4, 1 JAN-6ZY5G, 2 JAN-6Y6G, 2 JAN-6SF5, 4 JAN-OD3/VR150, 1 JAN-OC3/VR105, 1 JAN-707A.

REFERENCE DATA AND LITERATURE:

TO 16-55-68 (Spare Parts List).

SHIPPING DATA:

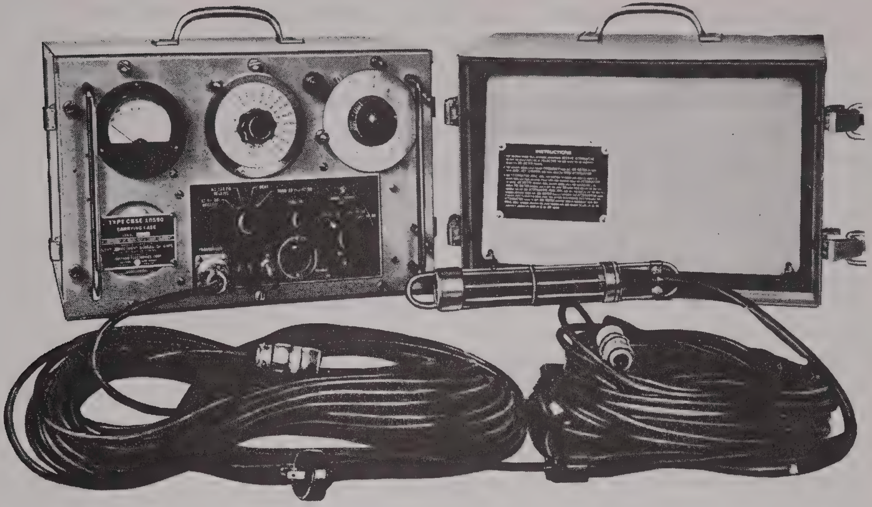
No. of Boxes	Contents & Identification	Volume (Cu. Ft.)	Over-all Dimensions (inches)			Weight Packed (Lbs.)
			H	W	D	

SIGNAL GENERATOR BC-1277-A
(GENERATOR, SIGNAL, BC-1277-A)

EQUIPMENT SUPPLIED:

Quant. Per Eq'pt	Name and Nomenclature	Case Mat'l	Stock Numbers (USAF) (Navy) (Army)	Over-all Dimensions (inches)			Weight (Lbs.)
				H	W	D	
1	Signal Generator BC-1277-A		3F3840-1277A	14-7/8	18-11/16	11-1/8	72
1	Case CH-147-A		7CAC-176564 6F847A	26-1/16	18-1/4	19-3/16	44
						Total:	116

SONAR TEST EQUIPMENT OCP-3



FUNCTIONAL DESCRIPTION:

A portable, general purpose, underwater sound detection test instrument used to test shipboard sonar equipment. The instrument is designed to generate and receive ultra-sonic signal energy and to perform relative power and frequency measurements.

RELATIONSHIP TO OTHER EQUIPMENT:

The OCP-3 is similar to the OCP, OCP-1, OCP-2 and the OAX series, except the OCP-3 operates over a greater frequency range.

ELECTROMECHANICAL DESCRIPTION:

Circuit Information: The test set consists primarily of a transducer assembly and an oscillator-amplifier assembly. The transducer assembly consists of a permanent-magnet, magnetostriction-type transducer in a protective cover with 135 feet of two conductor cable. The oscillator-amplifier unit acts both as a

(Continued)

	AIR FORCE	NAVY	ARMY
TYPE CLASS.		Standard	
STOCK NOS.		(ASO) R16NAV-OCP-3	
PROCUREM'T INFO.: MIL-T-15866 (SHIPS) and SHIPS-T-62			
PROCUREM'T COG.: Navy		DESIGN COG.: Navy, BuShips	
F.I.I.N.: 6625-031-1535		FUNCTIONAL CLASS. NO.: 10.1.3	

SONAR TEST EQUIPMENT OCP-3

ELECTROMECHANICAL DESCRIPTION: (Continued)

source of electrical energy for driving the transducer and as an amplifier for electrical signals received from the transducer. The oscillator-amplifier is comprised of a power supply, a receiver circuit with measured and monitored outputs and a beat frequency oscillator. The output of the oscillator is variable in 3 decibel steps by means of a calibrated potentiometer.

Power Supply: 100 to 130 volts, AC, 60 cycles per second, single-phase, 60 watts

Frequency Range: 7 to 70 kilocycles per second in 4 bands.

Transducer:

Power Input: 5 watts, minimum.

Output Impedance: Approximately 27 + J42 ohms at 30 kilocycles per second.

Response: ±3 decibels from a straight line passing through points of -120 decibels at 70 kilocycles per second and -130 decibels at 7 kilocycles per second.

Oscillator-Amplifier:

Output to transducer: 1.0 watt maximum.

Output to Speaker: 0.25 watt.

Output Impedance: 50 ohms.

Frequency Stability: Oscillator, accurate within ±2% of dial markings for temperatures of 0 to 50°C.

MANUFACTURERS' OR CONTRACTORS' DATA:

David Bogen Company, 29 Ninth Avenue, New York, New York; Contract No. NObsr-52512; Approximate Cost per Unit, $817.00.

TUBE COMPLEMENT:

5 6SJ7, 1 6H6, 1 6V6GT/G, 1 6SN7WGT, 1 OD3, 1 5Y3GTG.

REFERENCE DATA AND LITERATURE:

NavShips 91601 (Instruction Book).

SHIPPING DATA:

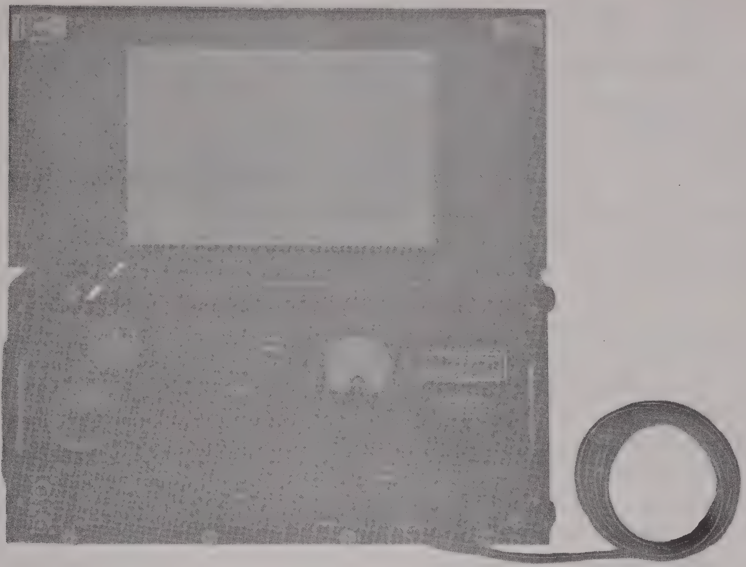
No. of Boxes	Contents & Identification	Volume (Cu. Ft.)	Overall Dimensions (inches)			Weight Packed (Lbs.)
			H	W	D	
1	Sonar Test Equipment OCP-3	5.23	15	21-1/2	28	110.5

SONAR TEST EQUIPMENT OCP-3

EQUIPMENT SUPPLIED:

Quant. Per Eq'pt	Name and Nomenclature	Case Mat'l	Stock Numbers (USAF) (Navy) (Army)	Overall Dimensions (inches)			Weight (Lbs.)
				H	W	D	
1	Sonar Test Equipment OCP-3 Including:	metal		9-3/4	15	20-3/8	
1	Oscillator-Amplifier CD1-50283-B		(ASO) R16NAV-OCP-3 BGN	9-3/4	15	12	37.5
2	Transducer 51112		(ASO) R16BGN-300HN	11-9/16	19-1/2 dia.		11
1	Extension Cable						
1	Carrying Case CBSE-10590			9-3/4	15	20-3/8	13

RADIO FREQUENCY TEST SET TS-13/AP
(TEST SET, RADAR, TS-13/AP)



FUNCTIONAL DESCRIPTION:

A combination set used for bench and field testing of radar sets. It measures power output, transmitter frequency, signal to noise ratio, intermediate frequency bandpass and provides a signal for receiver tuning. It may also be used for standard signal generator tests. The frequency and power are obtained from directly calibrated dials on the front panel. All controls and indicators are located on the front panel.

RELATIONSHIP TO OTHER EQUIPMENT:

This set is used as a source of radio frequency power for the TS-12/AP when making standing wave ratio measurements.

TS-34/AP oscilloscope will provide a suitable sawtooth input for TS-13/AP for frequency modulated output.

	AIR FORCE	NAVY	ARMY
TYPE CLASS.	Standard		
STOCK NOS.	7CAC-801319-2288	SNSN-F16-T-20133-515.1 ASO-R16-T-1873	3F4325-13
PROCUREM'T INFO.:	Navy Spec. No. RE-9063		
PROCUREM'T COG.:	Navy	DESIGN COG.:	Navy, BuShips
F.I.I.N.:		FUNCTIONAL CLASS, NO.:	10.1.3
	- Electronics Test Equipment -		TS-13/AP

This project was supported by the USAF on Contract AF 33(600)28276 and monitored by WADC, ARDC - Carl L. Frederick, Bethesda, Md. - Multilithed in U. S. A.

RADIO FREQUENCY TEST SET TS-13/AP
(TEST SET, RADAR, TS-13/AP)

ELECTROMECHANICAL DESCRIPTION:

Circuit Information: Consists of a signal generator with calibrated attenuator, a wavemeter and a thermistor power-measuring circuit. The signal generator output is either pulsed or continuous wave. The width of the square wave output is variable and phaseable.

Power Supply: 115 volts ±10%, AC, single phase, 60 to 800 cycles per second, 150 watts approximately.

Frequency Range: 9305 to 9445 megacycles per second.

Type of Transmission: Continuous Wave, Frequency Modulated, Pulsed Carrier.

Type of Reception: Continuous Wave, Pulsed Carrier.

Power Output: 50 microwatts for one-half scale of meter deflection (continuous wave at 1000 pulses per second. Pulse peak within 10% of CW.

Output Impedance: 50 ohms.

Pulse Width: 1 to 2 microseconds.

Pulse Phasing: 6 to 200 microseconds.

Attenuator Calibration: -13 to -65 dbm.

Accuracy: ±2 megacycles per second frequency.
±1 dbm power.

Signal Input: Positive trigger pulses not less than 15 volts and 1 to 20 microseconds pulse width. Negative trigger pulses not less than 50 volts.

Sensitivity: 50 microwatts for half-scale meter deflection of power meter.

Internal Synchronization: 1000 cycles per second.

Temperature Limits: Not to exceed 105° F.

MANUFACTURERS' OR CONTRACTORS' DATA:

Presto Recording Corporation, 242 W. 55th Street, New York, New York; Type B; Contract No. NXss-33647; Order No. 545-DAY-45, 1 September 1944; Approximate Cost per Unit, $1254.60.

TUBE COMPLEMENT:

3 JAN-6SN7, 2 JAN-6AC7, 1 JAN-5Y3GT, 1 JAN-6Y6, 1 JAN-5U4G, 3 JAN-OC3/VR-105, 1 JAN-723-A/B(2K25).

REFERENCE DATA AND LITERATURE:

TO 16-35TS13-2 (Maintenance Instructions).

SHIPPING DATA:

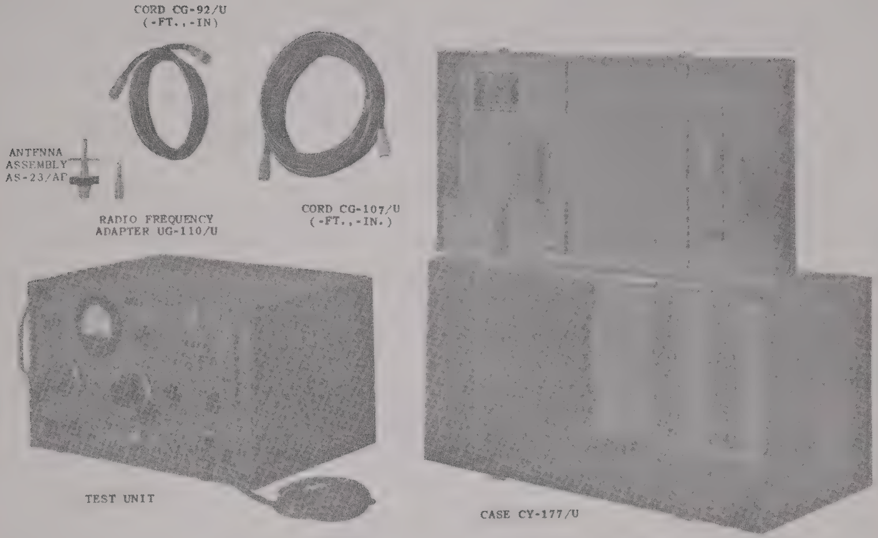
No. of Boxes	Contents & Identification	Volume (Cu. Ft.)	Over-all Dimensions (inches)			Weight Packed (Lbs.)
			H	W	D	
1	Test Set, TS-13/AP with accessories (Shelf Package)	4.77	22	25	15	87

RADIO FREQUENCY TEST SET TS-13/AP
(TEST SET, RADAR, TS-13/AP)

EQUIPMENT SUPPLIED:

Quant. Per Eq'pt	Name and Nomenclature	Case Mat'l	Stock Numbers (USAF) (Navy) (Army)	Over-all Dimensions (inches)			Weight (Lbs.)
				H	W	D	
1	Test Set TS-13/AP	Metal	7CAC-801319-2288 F16-T-20133-515.1 R16-T-1873 3F4325-13	11-1/2	21	10-1/2	73
1	Adapter UG-81/U		1800-286054446 R16-A-407 2Z308-81				
1	RF Cable RG-9/U with UG-24/U connector		3300-150425190 R16-AN-CG-92/U 1F425-9.72	72 long			
1	Synchronizing Cable RG-11/U with Type 49195 connector		3300-132335587 1F425-11	72 long			
1	Pickup Horn AT-48/UP		7CGJ-A4331 N16-RA-4293-3 2A203-48	2	2-1/2	5-1/3	
1	Spare Parts Box						
1	Instruction Book AN16-35TS13-3						

TEST SET TS-14/AP
(TEST SET, RADAR, TS-14/AP)



FUNCTIONAL DESCRIPTION:

A portable signal generator used for bench and field testing of various radar sets. This instrument can be used to check receiver sensitivity, measure transmitter power output, operate as a transfer frequency meter (uncalibrated) to align the transmitter and receiver closely to a common frequency. A thermistor is provided to measure transmitter power and to monitor the signal generator. The output signal frequency and power of the signal generator as well as transmitter output power are obtained from directly calibrated dials. All controls and indicators are located on the front panel.

RELATIONSHIP TO OTHER EQUIPMENT:

Similar to TS-14A/AP except that TS-14A/AP has a greater pulse width and shock mounts.

	AIR FORCE	NAVY	ARMY
TYPE CLASS.	Standard		
STOCK NOS.	7CAC-801319-2264	F16-Q-303050-200	3F4325-14
PROCUREM'T INFO.:	Navy Spec. No.	RE 9063	
PROCUREM'T COG.:	Navy	DESIGN COG.:	Navy, BuShips
F.I.I.N.:		FUNCTIONAL CLASS. NO.:	10.1.3
	- Electronics Test Equipment -		TS-14/AP

This project was supported by the USAF on Contract AF 33(600)28276 and monitored by WADC, ARDC - Carl L. Frederick, Bethesda, Md. - Multilithed in U. S. A.

TEST SET TS-14/AP
(TEST SET, RADAR, TS-14/AP)

ELECTROMECHANICAL DESCRIPTION:

Power Supply: 115 volts, AC, single phase, 50 to 800 cycles per second, 80 watts.
Frequency Range: 3200 to 3370 megacycles per second.
Type of Transmission: Continuous Wave, Pulsed Carrier.
Radio Frequency Power Output: -20 to -100 dbm peak.
10 milliwatts at -20 dbm setting.
Radio Frequency Power Input: 20 to 200 milliwatts average.
Accuracy: ±1 dbm power measurement.
±2 megacycles per second frequency.
Pulse Width: 1.0 to 2.8 microseconds at 1000 pulses per second.
Phasing: 10 to 200 microseconds after trigger at 1000 pulses per second.
Internal Synchronization: Pulse width: 2 microseconds fixed.
Pulse repetition rate: 300 to 2500 pulses per second.
Amplitude: Greater than 100 volts.
External Synchronization: Pulse width: 0.5 to 20 microseconds.
Pulse repetition rate: 300 to 2500 pulses per second.
Amplitude: 20 to 180 volts.
Temperature Range: -20° C. to +50° C.
Relative Humidity Range: Up to 95%.

MANUFACTURERS' OR CONTRACTORS' DATA:

Boonton Radio Corporation, Boonton, New Jersey; Order No. 1319-ARL-44; Approximate Cost per Unit, $1125.96.

TUBE COMPLEMENT:

4 JAN-6SN7, 1 JAN-6AC7, 1 JAN-446B, 1 JAN-OC3/VR-105, 1 JAN-5Y3GT.

REFERENCE DATA AND LITERATURE:

NavShips 900, 012-1B (Instruction Book).

SHIPPING DATA:

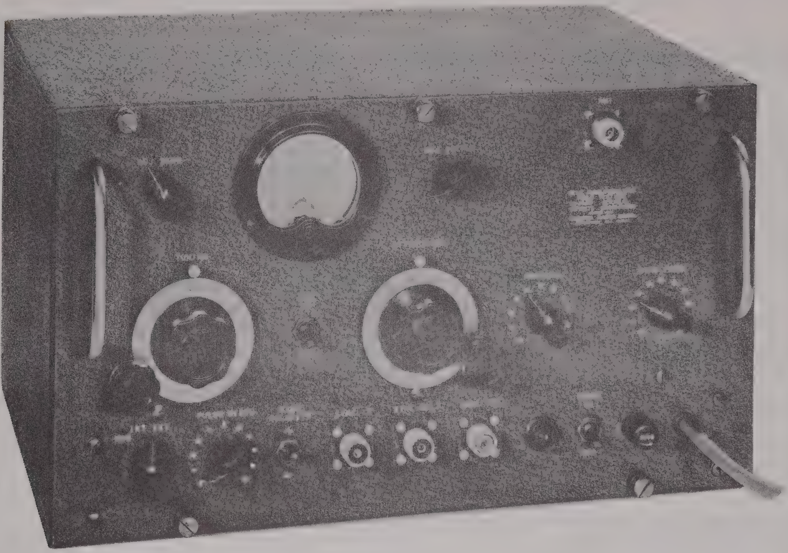
No. of Boxes	Contents & Identification	Volume (Cu. Ft.)	Over-all Dimensions (inches)			Weight Packed (Lbs.)
			H	W	D	
1	Test Set, TS-14/AP, with accessories (Shelf Package)	4.49	18	27	16	80

TEST SET TS-14/AP
(TEST SET, RADAR, TS-14/AP)

EQUIPMENT SUPPLIED:

Quant. Per Eq'pt	Name and Nomenclature	Case Mat'l	Stock Numbers (USAF) (Navy) (Army)	Over-all Dimensions (inches)			Weight (Lbs.)
				H	W	D	
1	Test Set TS-14/AP	Metal	7CAC-801319-2264 F16-T-20133-5811 3F4325-14	11-1/4	16-3/4	9-3/4	40
1	Cable CG-107/U (15)		16C-11588-1221 1F430-107.180	180 long			
1	Cable, Antenna CG-92/U		7CAC-170265-465 1F430-92.72	72 long			2
1	Adapter UG-110/U		3300-294732397 R16-AN-UG-110/U 2Z7390-110				
1	Dipole Antenna AS-23/AP		7CHE-A4369 R16-AN-AS-23/AP 2A264-23	40 long			0.6
1	Wrench, Hex L Shape		7900-859500 6R55496				
1	Wrench, Hex 5/64		7900-859490 6R57400				
1	Wrench, Hex L Shape		7900-859480 6R57400-6				
1	Carrying Case CY-177/U	Wood	7CAC-176572-45 R16-AN-CY-177/U 6F300-177	14	22-1/2	12	25
1	Instruction Book						
						Total:	70

TEST SET TS-14A/AP
(TEST SET, RADAR, TS-14A/AP)



FUNCTIONAL DESCRIPTION:

A portable signal generator used for bench and field testing of various radar sets. This instrument can be used to check receiver sensitivity, measure transmitter power output, operate as a transfer frequency meter (uncalibrated) to align the transmitter and receiver closely to a common frequency. A thermistor is provided to measure transmitter power and to monitor the signal generator. The output signal frequency and power of the signal generator as well as transmitter output power are obtained from directly calibrated dials. All controls and indicators are located on the front panel.

RELATIONSHIP TO OTHER EQUIPMENT:

Similar to Test Set TS-14/AP except for a greater pulse width variation and shockmounts. Superseded by TS-155C/UP.

	AIR FORCE	NAVY	ARMY
TYPE CLASS.			
STOCK NOS.	1690-327876500		3F4325-14A
PROCUREM'T INFO.:	Navy Spec. RE 9061		
PROCUREM'T COG.:	Navy	DESIGN COG.:	Navy, BuShips
F.I.I.N.:		FUNCTIONAL CLASS. NO.:	10.1.3
	- Electronics Test Equipment -		TS-14A/AP

This project was supported by the USAF on Contract AF 33(600)28276 and monitored by WADC, ARDC - Carl L. Frederick, Bethesda, Md. - Multilithed in U. S. A.

TEST SET TS-14A/AP
(TEST SET, RADAR, TS-14A/AP)

ELECTROMECHANICAL DESCRIPTION:

Power Supply: 115 volts ±10%, AC, single phase, 50 to 800 cycles per second, 80 watts.
Frequency Range: 3200 to 3370 megacycles per second.
Type of Transmission: Continuous Wave, Pulsed Carrier.
Radio Frequency Power Output: -20 to 100 decibels, peak.
10 milliwatts at -20 decibels setting.
Radio Frequency Power Input: 20 to 200 milliwatts average.
Output Impedance: 50 ohms.
Accuracy: ±1 decibel power measurement.
±2 megacycles per second frequency.
Pulse Width: 1 to 7 microseconds at 1000 pulses per second.
Phasing: 10 to 200 microseconds after trigger at 1000 pulses per second.
Internal Synchronization:
Pulse Width: 2 microseconds fixed.
Pulse Repetition Rate: 300 to 2500 pulses per second.
Amplitude: Greater than 100 volts.
External Synchronization:
Pulse Width: 0,5 to 20 microseconds.
Pulse Repetition Rate: 300 to 2500 pulses per second.
Amplitude: 20 to 180 volts.

MANUFACTURERS' OR CONTRACTORS' DATA:

Boonton Radio Corporation, Boonton, New Jersey, Navy Contract No. NXss-30263; Approximate Cost per Unit, $750.00.

TUBE COMPLEMENT:

4 JAN-6SN7, 1 JAN-6AC7, 1 JAN-446B, 1 JAN-OC3/VR-105, 1 JAN-5Y3GT.

REFERENCE DATA AND LITERATURE:

SHIPPING DATA:

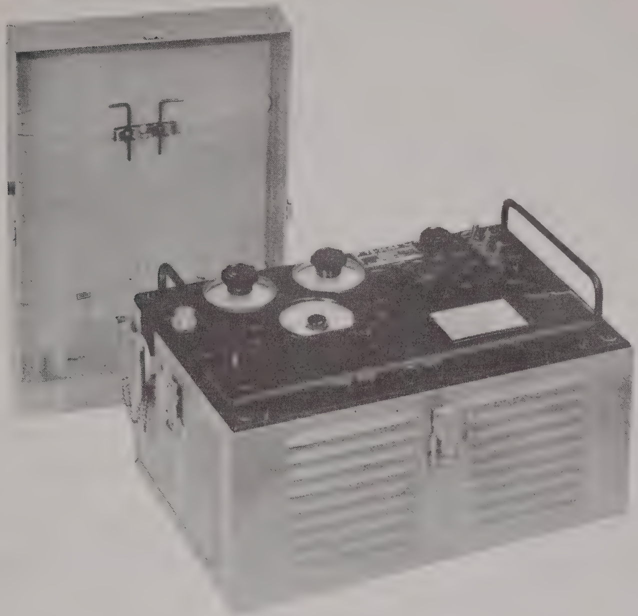
No. of Boxes	Contents & Identification	Volume (Cu. Ft.)	Over-all Dimensions (inches)			Weight Packed (Lbs.)
			H	W	D	
1	Test Set TS-14A/AP (Domestic Packed, Water Resistant Carton)	4.49	27	18	16	80

TEST SET TS-14A/AP
(TEST SET, RADAR, TS-14A/AP)

EQUIPMENT SUPPLIED:

Quant. Per Eq'pt	Name and Nomenclature	Case Mat'l	Stock Numbers (USAF) (Navy) (Army)	Over-all Dimensions (inches)			Weight (Lbs.)
				H	W	D	
1	Test Set TS-14A/AP	Metal	1690-327876500 3F4325-14A	16-3/4	11-1/4	9-3/4	40
1	Case CY-177/U	Wood	7CAC-176572-45 N16-C-170001-280 6F300-177	21-1/2	14-1/2	11-1/2	25
1	Antenna Assembly AS-23/AP		7CHE-A4369 F16-A-45216-3476 2A264-23	2-1/4	4	1-1/4	0.19
1	RF Adapter UG-110/U		3300-294732397 N17-C-67994-3440 2Z7390-110	2-1/2 long	5/8 dia.		0.06
1	Cord CG-107/U		N16-C-11588-1221 1F430-107.180	180 long			1.75
1	Cord CG-92/U		7CAC-170265-465 N16-C-11604-7121 1F430-92.72	72 long			

SIGNAL GENERATOR TS-35/AP
(GENERATOR, SIGNAL, TS-35/AP)



FUNCTIONAL DESCRIPTION:

A portable unit used for the testing and general maintenance of radar equipment. Produces radio frequency signals, either continuous wave or pulsed and internally or externally synchronized, of known frequency and power. Used to measure the frequency and average power of radar transmitter signals, and to produce frequency modulated signals for detection of defects in radar equipment. Will measure signal noise ratio, transmit received recovery time, frequency pulling, AFC operations (with or without Class "A" oscilloscope) and bandwidth. Consists of a Signal Generator, Frequency Meter and Power Meter. All controls and indicators are located on the front panel.

Power readings in dbm are obtained from the calibrated attenuator setting and the thermistor bridge balance indicator, which is calibrated in microamperes.

Frequency readings are obtained by translating the micrometer reading of the frequency meter into frequency by means of the calibration chart located on the signal generator panel.

	AIR FORCE	NAVY	ARMY
TYPE CLASS.			
STOCK NOS.	7CAC-801319-223	ESO-N-16-RT-75220 SNSN-F16-G-67344-9641	3F3901-35

PROCUREM'T INFO.: Western Electric Co. X-61721C; Spec. SC 371-5035

PROCUREM'T COG.: Army DESIGN COG.: Army, ESL

F.I.I.N.: FUNCTIONAL CLASS. NO.: 10.1.3

- Electronics Test Equipment - TS-35/AP

is project was supported by the USAF on Contract AF 33(600)28276 and monitored by WADC, ARDC - Carl L. Frederick, Bethesda, Md. - Multilithed in U. S. A.

SIGNAL GENERATOR TS-35/AP
(GENERATOR, SIGNAL, TS-35/AP)

RELATIONSHIP TO OTHER EQUIPMENT:

Refer to TS-35A/AP for information regarding improved model.

ELECTROMECHANICAL DESCRIPTION:

Signal Generator Circuit: A WE723-B tube mounted between top and bottom of the waveguide provides a velocity modulated Ultra High Frequency Oscillator. Tuning is accomplished by varying the separation between the oscillator tube grids. The oscillator probe occupies a position in the waveguide to permit half of the power furnished by the oscillator to be absorbed in the thermistor device and half to be fed to the calibrated attenuators for signal output purposes.

Frequency Meter Circuit: A coaxial line coupled to the waveguide by means of a probe antenna serves as the frequency meter. A calibrated micrometer attached to the coaxial line and to the probe antenna is used to vary the length of the line until resonance is indicated by a dip in the thermistor bridge circuit microammeter.

Power Meter Circuit: Temperature compensated thermistor bridge circuit is used. Power measurements are made by observation of the heating effects produced by the application of radio frequency power in changing the resistance of the thermistor mounted in the waveguide.

Synchronizing Circuit: Synchronizes the pulses generated in the signal generator with the radar transmitter pulses so that they may be viewed on either the radar indicator or an external oscilloscope as stationary images. This is done through the use of a start-stop multivibrator circuit which produces a pulse 7 microseconds in length (when the detector receives a pulse from the radar transmitter) causing the oscillator to produce a high frequency pulse.

Pulse Circuit: Similar to synchronizing circuit except that this circuit pulses continuously (2 microseconds on, 6 microseconds off) when not being synchronized, while the synchronizing circuit is normally stopped except when the transmitter pulse is received.

Pulse Data: When a synchronizing pulse is received, the signal generator output consists of a 7-microsecond pulse, followed by an off period of 10 microseconds, followed by a train of pulses 2 microseconds wide, spaced 6 microseconds apart.

Power Supply: 115 ±10%, AC, 50 to 1200 cycles per second, single phase.

Frequency Range: 8700 to 9500 megacycles per second.

Type of Reception: Continuous Wave, Pulsed Carrier.

Type of Transmission: Continuous Wave, Pulsed Carrier, Frequency Modulated Carrier.

Power Measurement Range: 0.1 milliwatts to 2 watts average.

Accuracies: ±1.2 decibels in absolute power measurement.
±0.5 decibel in differential power measurement.
±5.0 megacycles in absolute frequency measurement.
±0.5 megacycle in differential frequency measurement.

Power Output Range: 0 to -68 dbm continuous wave, +3 to -65 dbm peak pulsed.

SIGNAL GENERATOR TS-35/AP
(GENERATOR, SIGNAL, TS-35/AP

MANUFACTURERS' OR CONTRACTORS' DATA:

Western Electric Company, 195 Broadway, New York 7, New York; Order No. 768-DAY-4SRA and 870-DAY-45RA; Approximate Cost per Unit, $1606.94; Western Electric Type No. X-61721A.

TUBE COMPLEMENT:

2 JAN-6X5GT, 1 JAN-6V6GT, 1 JAN-6SL7GT, 1 JAN-VR-150/30, 2 JAN-6SN7GT, 1 RETMA WE723A, 2 RETMA 121A.

REFERENCE DATA AND LITERATURE:

TO 16-35TS35-3 (Maintenance Instructions).
TO 16-55-18 (Spare Parts List).
TO 16-35TS35-5 (TM 11-1238) (Maintenance Instructions).

SHIPPING DATA:

No. of Boxes	Contents & Identification	Volume (Cu. Ft.)	Overall Dimensions (inches)			Weight Packed (Lbs.)
			H	W	D	
1	Signal Generator TS-35/AP (Water Resistant Carton)	2.60	25	15	12	45

EQUIPMENT SUPPLIED:

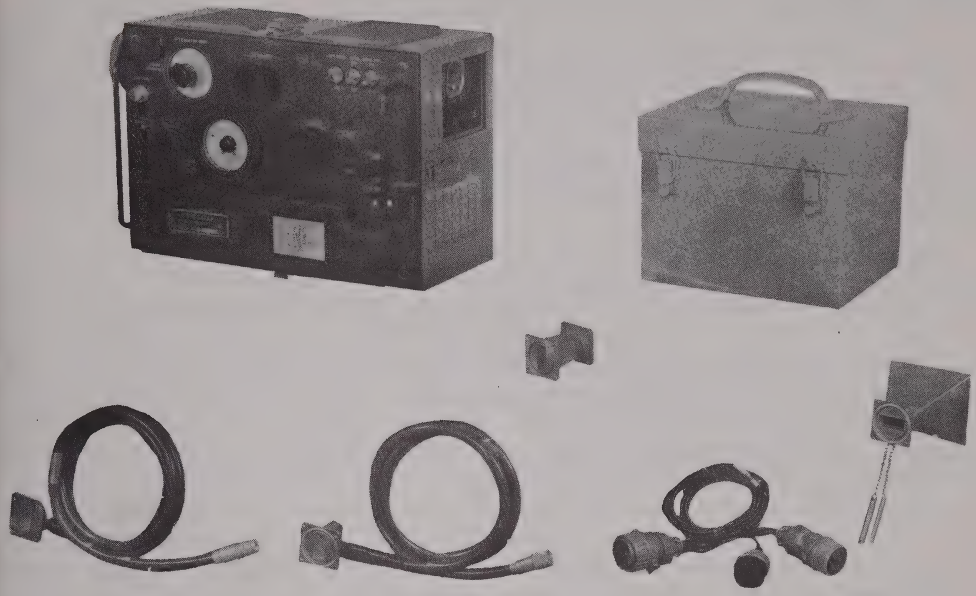
Quant. Per Eq'pt	Name and Nomenclature	Case Mat'l	Stock Numbers (USAF) (Navy) (Army)	Overall Dimensions (inches)			Weight (Lbs.)
				H	W	D	
1	Signal Generator TS-35/AP	Metal	7CAC-801319-223 N16-RT-75220 F16-G-67344-9641 3F3901-35	11-3/8	14-1/4	9-3/4	28.0
1	Accessory Set	Wood	1690-327022032 3F3901-35.3	10-5/8	8-1/4	8-3/8	6.5
Accessory Set Contains:						Total:	34.5
1	Horn Antenna AT-39/AP		7CAC-045625 2A203-39	AN Type choke coupling for 1-1/4 x 5/8 waveguide.			

SIGNAL GENERATOR TS-35/AP
(GENERATOR, SIGNAL, TS-35/AP)

EQUIPMENT SUPPLIED:

Quant. Per Eq'pt	Name and Nomenclature	Case Mat'l	Stock Numbers (USAF) (Navy) (Army)	Over-all Dimensions (inches)			Weight (Lbs.)
				H	W	D	
1	Cord CX-128/AP		7CAC-170264-845 3E6000-128-10	AC power cord, 4 prong male plug (AN-3106-22-10P) connected through a 4-inch cord to 4-hole female receptacle (AN-97-5103-22-10S). Two terminals of the 4 prong plug are also connected through a 10 ft. cord to a 2 prong receptacle (Hubbell 7259 body) which connects to the signal generator.			
1	Adapter MX-135/AP		7CAC-002919-85 2Z301-135	Tapered waveguide adapter, choke type coupling 1 x 1-1/2 one end, 1-1/4 x 5/8 other.			
1	Case CY-94/AP	Wood	1690-286749845 2Z1891-94	10-5/8	8-1/4	8-3/8	2. 25
1	Cord CG-61/AP		7CWX-BL485539 1F430-61. 60	Waveguide-to-coaxial plug (50 ohms RF-RG-8/U coaxial) choke coupling for 1-1/4 x 5/8 waveguide connects through 5 ft. flexible coaxial to AN coaxial plug.			
1	Cord CG-60/AP		7CWX-BL431313-1 1F430-60. 60	Coaxial jack-to-waveguide (flange) patch cable (50 ohm coaxial RF cable RG-8/U). AN type coaxial jack through 5 ft. flexible coaxial cable to flat flange coupling. Both for 1-1/4 x 5/8 waveguide.			

SIGNAL GENERATOR TS-35A/AP
(GENERATOR, SIGNAL, TS-35A/AP)



FUNCTIONAL DESCRIPTION:

A portable unit used for the testing and general maintenance of radar equipment. Produces radio frequency signals, either continuous wave or pulsed and internally or externally synchronized, of known frequency and power. Used to measure the frequency and average power of radar transmitter signals and to produce FM signals for detection of defects in radar equipment. Will measure signal noise ratio, transmit received recovery time, frequency pulling, AFC operations (with or without Class "A" oscilloscope) and bandwidth. Consists of a Signal Generator, Frequency Meter, and Power Meter. All controls and indicators are located on the front panel.

Power readings in dbm are obtained from the calibrated attenuator setting and the thermistor bridge balance indicator, which is calibrated in microamperes.

Frequency readings are obtained by translating the micrometer reading of the frequency meter into frequency by means of calibration chart located on the front panel.

(Continued)

	AIR FORCE	NAVY	ARMY
TYPE CLASS.			
STOCK NOS.	7CAC-801319-243	ESO-N16-RT-75311 SNSN-F17-T-20133-6101	3F3901-35A

PROCUREM'T INFO.:	Navy Spec. No. RE-13AG65		
PROCUREM'T COG.:	Army	DESIGN COG.:	Army, ESL
F.I.I.N.:		FUNCTIONAL CLASS, NO.:	10.1.3

This project was supported by the USAF on Contract AF 33(600)28276 and monitored by WADC, ARDC - Carl L. Frederick, Bethesda, Md. - Multilithed in U. S. A.

SIGNAL GENERATOR TS-35A/AP
(GENERATOR, SIGNAL, TS-35A/AP)

RELATIONSHIP TO OTHER EQUIPMENT:

TS-35A/AP consists of a TS-35/AP modified by substitution of Western Electric Type X-61721B Signal Generator (bare unit) for Western Electric Type X-61721A. Electrically, the X-61721B Signal Generator differs from the original model in that it has a broad band attenuator of 40 decibels with increased dial spread, a switchable broadband 30 decibel pad and a tube mount with improved shielding and smoother operation. It also has a new compensated thermistor-bridge circuit. Standard parts have been used throughout and unit treated for moisture.

Replaced by TS-147/UP.

ELECTROMECHANICAL DESCRIPTION:

Signal Generator Circuit: A WE-723-B tube mounted between top and bottom of the waveguide provides a velocity modulated Ultra High Frequency Oscillator. Tuning is accomplished by varying the separation between the oscillator tube grids, and also by the "REP" control which changes repeller voltage of the oscillator tube. The oscillator probe occupies a position in the waveguide to permit half the power furnished by the oscillator to be absorbed in the thermistor device and half to be fed to the calibrated attenuators for signal output purposes.

Frequency Meter Circuit: An open end coaxial line coupled to the waveguide by means of a probe antenna serves as the frequency meter. A calibrated micrometer attached to the coaxial line and to the probe antenna is used to vary the length of the line until resonance is indicated by a dip in the thermistor bridge circuit microammeter.

Power Meter Circuit: A temperature compensated thermistor bridge circuit is used. Power measurements are made by observation of the heating effects produced by the application of radio frequency power in changing the resistance of the thermistor mounted in the waveguide (observed by monitor meter reading).

Synchronizing Circuit: Synchronizes the pulses generated in the signal generator with the radar transmitter pulses so that they may be viewed on either the radar indicator or an external oscilloscope as stationary images. This is done through the use of a start-stop multivibrator circuit which produces a pulse 7 microseconds in length (when the detector receives a pulse from the radar transmitter) causing the oscillator to produce a high frequency pulse.

Pulse Circuit: Similar to synchronizing circuit except that this circuit pulses continuously (2 microseconds on, 6 microseconds off) when not being synchronized, while the synchronizing circuit is normally stopped except when the transmitter pulse is received.

Pulse Data: When a synchronizing pulse is received, the signal generator output consists of a 7-microsecond pulse, followed by an off period of 10 microseconds, followed by a train of pulses 2 microseconds wide, spaced 6 microseconds apart.

Power Supply: 115 volts ±10%, AC, single phase, 50 to 1600 cycles per second, 1.5 amperes approximately.

Type of Reception: Continuous Wave, Pulsed Carrier.

(Continued)

SIGNAL GENERATOR TS-35A/AP
(GENERATOR, SIGNAL, TS-35A/AP)

ELECTROMECHANICAL DESCRIPTION: (Continued)

Type of Transmission: Continuous Wave, Pulsed Carrier, Frequency Modulated Carrier.

Frequency Range: 8500 to 9600 megacycles per second.

Power Measurement Range: 0.1 milliwatt to 2 watts average.

Power Output Range: -68 to 0 dbm, CW; -65 to +3 dbm, peak pulsed.

Output Impedance: 50 ohms.

Accuracies: ±1.5 decibels in absolute power measurement from 1 milliwatt to 2 watts.
±0.2 decibel in differential power measurement from 0.1 milliwatt to 1 milliwatt.
±5 megacycles per second in absolute frequency measurement.
±0.5 megacycles per second in differential frequency measurement.

Temperature Range: -40° C. to +50° C.

MANUFACTURERS' OR CONTRACTORS' DATA:

Western Electric Company, 195 Broadway, New York 7, New York; Order No. 870-DAY-45RA; Western Electric Type No. X-61721B; Approximate Cost per Unit, $1964.00; 1945; Order No. 2118-DAY-45, 21 February 1945, Approximate Cost per Unit, $1964.00; Order No. 85-DAY-44, 30 November 1943, Approximate Cost per Unit, $ 1378. 00.

TUBE COMPLEMENT:

3 JAN-6X5GT/G, 1 JAN-6V6GT/G, 2 JAN-6SL7GT, 1 JAN-OD3/VR-150, 3 JAN-6SN7GT, 2 RETMA-121A, 1 JAN-2K25, 2 RETMA-D170396 (Thermistor). 1 JAN-1N23 (Crystal).

REFERENCE DATA AND LITERATURE:

TO 16-35TS35-2 (Maintenance Instructions).
TO 16-55-157 (Spare Parts List).
TO 16-35TS35-5 (TM 11-1238A) (Technical Manual).
TO 16-35TS35-6 (TM 11-1238A)
TO 16-35TS35-41 (Modification to permit testing radar beacons).

SHIPPING DATA:

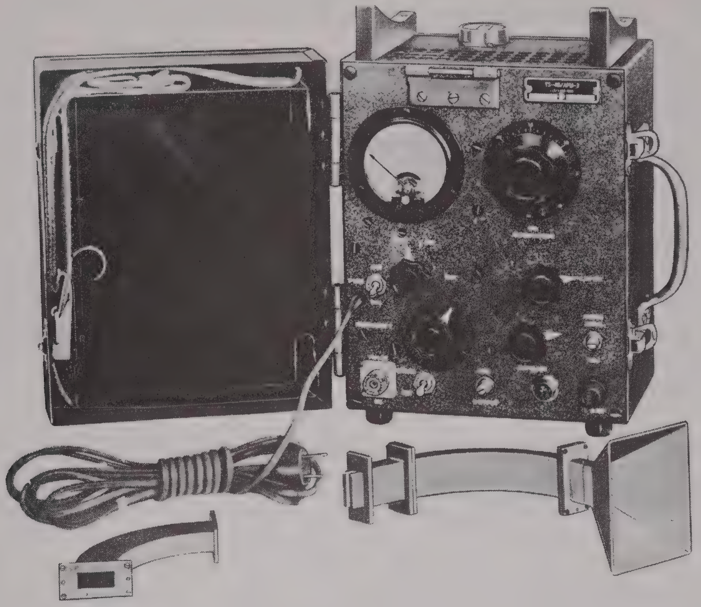
No. of Boxes	Contents & Identification	Volume (Cu. Ft.)	Over-all Dimensions (inches)			Weight Packed (Lbs.)
			H	W	D	
1	Signal Generator, TS-35A/AP with accessories (Water Resistant Carton)	2.60	25	15	12	45

SIGNAL GENERATOR TS-35A/AP
(GENERATOR, SIGNAL, TS-35A/AP)

EQUIPMENT SUPPLIED:

Quant. Per Eq'pt	Name and Nomenclature	Case Mat'l	Stock (USAF) Numbers (Navy) (Army)	Over-all Dimensions (inches)			Weight (Lbs.)
				H	W	D	
1	Signal Generator TS-35A/AP	Metal	7CAC-801319-243 N16-RT-75311 F17-T-20133-6101 3F3901-35A	11-1/4	15-5/8	10-5/8	32.5
1	Accessory Set Including:	Wood	1690-327022032 3F3901-35.3	10-5/8	8-1/4	8-3/8	6.5
1	Horn Antenna AT-39/AP		7CAC-045625 2A203-39	AN Type choke coupling for 1-1/4 x 5/8 waveguide.			
1	Cord CX-128/AP		7CAC-170264-845 3E6000-128-10	AC power cord, 4 prong male plug (AN-3106-22-10P) connected through a 4-inch cord to 4 hole female receptacle (AN-97-5103-22-10S). Two terminals of the 4 prong plug are also connected through a 10 ft. cord to a 2 prong receptacle (Hubbell 7259 body) which connects to the signal generator.			
1	Adapter MX-135/AP		7CAC-002919-85 2Z301-135	Tapered waveguide adapter, choke type coupling 1 x 1-1/2 one end, 1-1/4 x 5/8 other end.			
1	Case CY-94/AP	Wood	7CAC-176572-35 2Z1891-94	10-5/8	8-1/4	8-3/8	2.25
1	Cord CG-61/AP		7CWX-BL485539 1F430-61.60	Waveguide-to-coaxial plug (50 ohms RF-RG-8/U coaxial) choke coupling for 1-1/4 x 5/8 waveguide connects through 5 ft. of flexible coaxial to an AN coaxial plug.			
1	Cord CG-60/AP		7CWX-BL431313-1 1F430-60.60	Coaxial jack-to-waveguide (flange) patch cable (50 ohm coaxial RF cable RG-8/U). AN type coaxial jack through 5 ft. flexible coaxial cable to flat flange coupling. Both for 1-1/4 x 5/8 waveguide.			

RADAR TEST SET TS-45/APM-3
(TEST SET, RADAR, TS-45/APM-3)



FUNCTIONAL DESCRIPTION:

A portable frequency-power-meter designed to measure the average power output and frequency of Radar Set AN/APS-4. Also contains a signal generator that is used for receiver alignment and sensitivity checks.

Frequency calculations are made from a calibrated meter-dial and an associated chart. Resonance is indicated by a sharp dip in the reading of the microammeter. Power is determined by the reading of the microammeter and calibrated attenuator.

RELATIONSHIP TO OTHER EQUIPMENT:

TS-45A/APM-3 is a redesign of TS-45/APM-3 to incorporate a larger power transformer, larger filter choke, larger indicating instrument, and a larger case.

When Auxiliary Test Kit TS-76/APM-3 is supplied with TS-45/APM-3, the combination is known as AN/APM-3.

ELECTROMECHANICAL DESCRIPTION:

Power Supply: 45 watts at 105 to 130 volts, 60 to 800 cycles per second.

(Continued)

	AIR FORCE	NAVY	ARMY
TYPE CLASS.			
STOCK NOS.	7CAC-801319-58	ASO-R16-AN-TS-45/APM-3	3F4325-45
PROCUREM'T INFO.:	Western Electric Spec. No. D-151690		
PROCUREM'T COG.:	Navy	DESIGN COG.:	Navy, BuAer
F.I.I.N.:		FUNCTIONAL CLASS. NO.:	10.1.3

This project was supported by the USAF on Contract AF 33(600)28276 and monitored by WADC, ARDC - Carl L. Frederick, Bethesda, Md. - Multilithed in U. S. A.

RADAR TEST SET TS-45/APM-3
(TEST SET, RADAR, TS-45/APM-3)

ELECTROMECHANICAL DESCRIPTION: (Continued)

Type of Reception: Continuous Wave, Modulated Carrier Wave, Pulse.

Type of Transmission: Continuous Wave.

Input:

Frequency Range: 9300 to 9450 megacycles per second.

Power Range: +10 dbm to +30 dbm. (This unit contains an attenuator which is calibrated from 0 to 30 decibels).

Impedance: Choke coupling.

Output:

Frequency Range: 9300 to 9400 megacycles per second.

Signal Range: 10 milliwatts average continuous wave power. While the signal generator section of this test set is designed for continuous wave operating, it may be externally pulsed by a pulse generator unit such as AN/UPM-15, Pulse Generator Set.

Impedance: Choke coupling.

Accuracy:

Frequency Meter: ±2 megacycles per second; ±5 megacycles per second absolute.

Power Meter: ±1.5 decibels for attenuator settings between 0 decibel and 16 decibels; ±2.5 decibels for attenuator settings between 16 decibels and 32 decibels.

Temperature Range: 0° F. to 120° F.

MANUFACTURERS' OR CONTRACTORS' DATA:

Western Electric Company, New York, New York; Navy Contract No. NXsa-32197; Western Electric Specification No. D-751690.

TUBE COMPLEMENT:

1-723A/B, 1 JAN-6V6GT/G, 2 JAN-6X5GT/G, 1 JAN-6SL7GT, 2 JAN-OC3/VR-105, 1 JAN-1N21B (Crystal Rectifier).

REFERENCE DATA AND LITERATURE:

TO 16-35TS45-2 (Maintenance Instructions).

SHIPPING DATA:

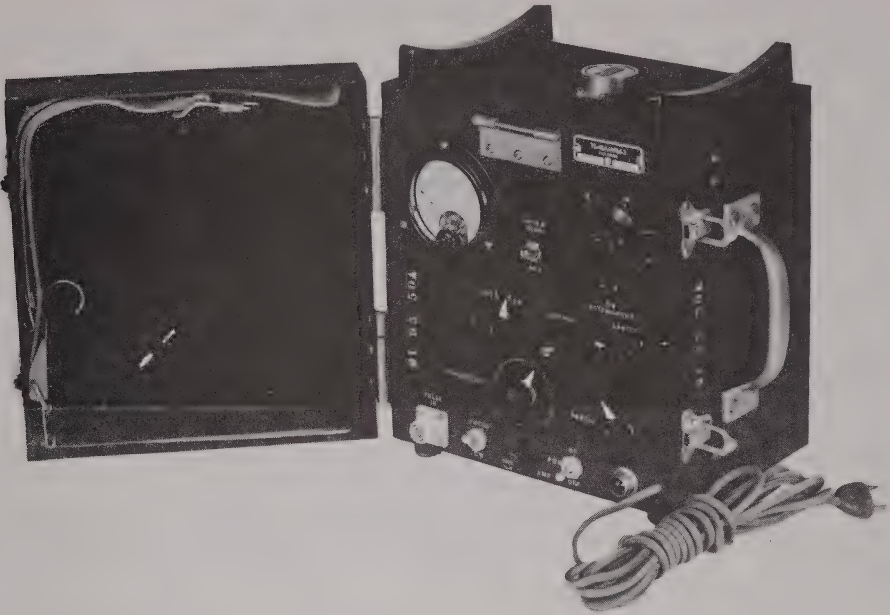
No. of Boxes	Contents & Identification	Volume (Cu. Ft.)	Over-all Dimensions (inches)			Weight Packed (Lbs.)
			H	W	D	
1	Radar Test Set, TS-45/APM-3 with accessories (Packed in Water Resistant Fiber Box)	1.46	15	12	14	29

RADAR TEST SET TS-45/APM-3
(TEST SET, RADAR, TS-45/APM-3)

EQUIPMENT SUPPLIED:

Quant. Per Eq'pt	Name and Nomenclature	Case Mat'l	Stock (USAF) Numbers (Navy) (Army)	Over-all Dimensions (inches)			Weight (Lbs.)
				H	W	D	
1	Radar Test Set TS-45/APM-3 (Complete)		7CAC-801319-58 R16-AN-TS-45/APM-3 3F4325-45	11-1/4	8-1/2	7	22
1	Crystal Rectifier 1N21B		3300-234137020 2J1N21-B				
5	Fuse 3AG-1040		8800-361200 3Z1926	1-1/4	1/4 dia.		
1	Lamp LM-27		8800-444200 2Z5927				
1	Book of Maintenance Instructions		6D9810-45				
1	Strap Mounting		6Z8472-12				

RADAR TEST SET TS-45A/APM-3
(TEST SET, RADAR, TS-45A/APM-3)



UNCTIONAL DESCRIPTION:

A portable frequency meter and power meter designed to measure the average ower output and frequency of Radar Set AN/APS-4. Also contains a signal generaor that is used for receiver alignment and sensitivity checks.

Frequency calculations are made from a calibrated meter-dial and an associated hart. Resonance is indicated by a sharp dip in the reading of the microammeter. ower is determined by the reading of the microammeter and calibrated attenuator.

RELATIONSHIP TO OTHER EQUIPMENT:

TS-45A/APM-3 is a redesign of TS-45/APM-3 to incorporate a larger power ransformer, larger filter choke, larger indicating instrument, and larger case.

When Auxiliary Test Kit TS-76A/APM-3 is supplied with TS-45A/APM-3, the ombination is known as AN/APM-3A.

	AIR FORCE	NAVY	ARMY
TYPE CLASS.			
STOCK NOS.	1690-327386500	ASO-R16-AN-TS-45A/APM-3	3F4325-45A
PROCUREM'T INFO.:			
PROCUREM'T COG.: Navy		DESIGN COG.: Navy BuAer	
F.I.I.N.:		FUNCTIONAL CLASS. NO.: 10.1.3	
	- Electronics Test Equipment -		TS-45A/APM-3

s project was supported by the USAF on Contract AF 33(600)28276 and monitored by WADC, ARDC - Carl L. Frederick, Betheada, Md. - Multilithed in U.S.A.

RADAR TEST SET TS-45A/APM-3
(TEST SET, RADAR, TS-45A/APM-3)

ELECTROMECHANICAL DESCRIPTION:

Power Supply: 55 watts at 105 to 130 volts, 60 to 800 cycles per second or 55 watts at 120 to 127 volts, 2400 cycles per second.

Type of Reception: Continuous Wave, Modulated Carrier Wave, Pulse.

Type of Transmission: Continuous Wave.

Input:

- Frequency Range: 9300 to 9450 megacycles per second.
- Power Range: +10 dbm to +30 dbm. (This unit contains an attenuator which is calibrated from 0 to 30 decibels.)
- Impedance: Choke coupling.

Output:

- Frequency Range: 9300 to 9400 megacycles per second.
- Signal Range: 10 milliwatts average continuous wave power (-20 to 10 dbm). While the signal generator section of this test set is designed for continuous wave operating, it may be externally pulsed by a pulse-modulator unit such as the AN/UPM-15 Pulse Generator Set.
- Impedance: Choke coupling.

Accuracy: Frequency meter, ±5 megacycles per second.
Power meter, ±1.5 decibel for attenuator settings between 0 decibel and 16 decibels; ±2.5 decibels for attenuator settings between 16 decibels and 32 decibels.

Temperature Range: 0° F. to 120° F.

MANUFACTURERS' OR CONTRACTORS' DATA:

Western Electric Company, New York, New York, Navy Contract No. NXsa-32197, Western Electric Specification No. D-151776.

TUBE COMPLEMENT:

1-723A/B, 1 JAN-6V6GT/G, 2 JAN-6X5GT/G, 1 JAN-6SL7GT, 2 JAN-OC3/VR-105, 1 JAN-1N21B (Crystal Rectifier).

REFERENCE DATA AND LITERATURE:

SHIPPING DATA:

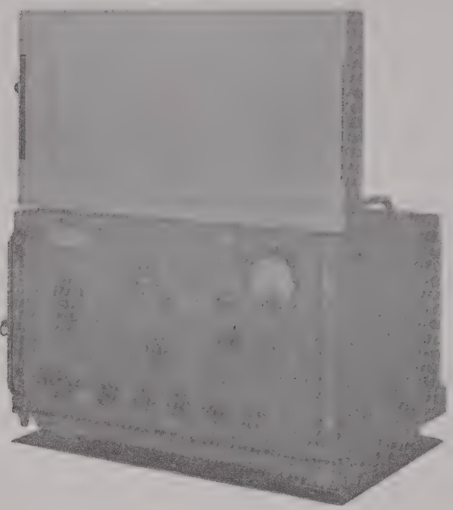
No. of Boxes	Contents & Identification	Volume (Cu. Ft.)	Over-all Dimensions (inches)			Weight Packed (Lbs.)
			H	W	D	
1	Radar Test Unit TS-45A/APM-3 with accessories (Water Resistant Carton)	1.46	15	12	14	29

RADAR TEST SET TS-45A/APM-3
(TEST SET, RADAR, TS-45A/APM-3)

EQUIPMENT SUPPLIED:

Quant. Per Eq'pt	Name and Nomenclature	Case Mat'l	Stock Numbers (USAF) (Navy) (Army)	Over-all Dimensions (inches)			Weight (Lbs.)
				H	W	D	
1	Radar Test Unit TS-45A/APM-3 (Complete)		1690-327386500 R16-AN-TS-45A/APM-3 3F4325-45A	11-1/4	8-1/2	10-3/4	22
1	Crystal Rectifier 1N21B		3300-234137020 2J1N21-B				
5	Fuse 3AG-1040		8800-361200 3Z1926	1-1/4 long	1/4 dia.		
1	Lamp LM-27		8800-444200 2Z5927				
1	Book of Maintenance Instructions CO-AN-08-35TS45-2-M		6D9810-45				
1	Strap Mounting		6Z8472-12				

TEST SET TS-120/UP
(TEST SET, RADAR, TS-120/UP)



FUNCTIONAL DESCRIPTION:

A portable signal generator used for accurate measurement and adjustment work on radar and radar-beacon equipment. It functions as a signal generator, frequency meter, and wattmeter. It will measure output frequency, power, local oscillator frequency, receiver sensitivity and receiver IF band width of radars and radar beacons.

RELATIONSHIP TO OTHER EQUIPMENT:

ELECTROMECHANICAL DESCRIPTION:

Circuit Information: A built-in pulse modulator supplies modulation signals for square wave and short pulse outputs. Provision is made for triggering the internal pulses by means of an external trigger of either polarity. It is possible to obtain a frequency modulated output signal by means of an external saw-tooth wave.

(Continued)

	AIR FORCE	NAVY	ARMY
TYPE CLASS.	Limited Standard		
STOCK NOS.	7CAC-801319-2642	SNSNF16-T-20134-6501	3F4325-120
PROCUREM'T INFO.:	BuShips Spec. RE-9514B		
PROCUREM'T COG.:	Navy	DESIGN COG.:	Navy, BuShips
F.I.I.N.:		FUNCTIONAL CLASS. NO.:	10.1.3

is project was supported by the USAF on Contract AF 33(600)28276 and monitored by WADC, ARDC - Carl L. Frederick, Bethesda, Md. - Multilithed in U. S. A.

TEST TS-120/UP
(TEST SET, RADAR, TS-120/UP)

ELECTROMECHANICAL DESCRIPTION: (Continued)

Power Supply: 115 volts ±10%, AC, single phase, 50 to 800 cycles per second, 157.5 watts at 60 cycles per second.

Frequency Range: 9285 to 9465 megacycles per second.

Type of Transmission: Continuous Wave, Short Pulse and Square Wave Modulated Carrier.

Accuracies: ±2 megacycles, ±1.5 decibels at 77° F.

Modulation Frequency: 1200 cycles per second square wave.

Pulse Width: 0.2 to 0.5 microseconds or 1 to 2 microseconds.

Pulse Delay: 10 to 200 microseconds variable; 0 microseconds (approximately), fixed.

Power Output: 0 to 77 decibels below 1 milliwatt peak pulse.

Power Input: 5 to 32 decibels above 1 milliwatt average.

Video Output: 10 to 15 volts negative.

Output Impedance: 50 ohms.

Synchronization: Internal for square wave output only. 200 to 2500 cycles per second, positive trigger 25 to 200 volts peak or negative trigger 30 to 200 volts peak, on short pulse only.

MANUFACTURERS' OR CONTRACTORS' DATA:

Airadio, Incorporated, Stamford, Connecticut; Contract No. NXsr-60003, Mfg. Ident. AS 1353, Approximate Cost per Unit, $2,500.00, May 31, 1944; Contract No. NXsr-69247, Mfg. Ident. MF 1014, Approximate Cost per Unit, $2,500.00, June 1945; Contract No. NXsr-44551, Mfg. Ident. RE 1065, Approximate Cost per Unit, $2,500.00.

TUBE COMPLEMENT:

2 JAN-6SN7W, 2 JAN-2050, 2 JAN-6AC7, 1 JAN-6AG5, 1 JAN-723-A/B, 1 JAN-5R4GY, 1 JAN-6X5GT/G, 1 JAN-6Y6G, 1 JAN-6SH7, 2 JAN-OC3/VR-105.

REFERENCE DATA AND LITERATURE:

TO 16-35TS120-5 (Maintenance Instructions).
NavShips 386 (Instruction Book).
TO 16-55-313 (Spare Parts List).

SHIPPING DATA:

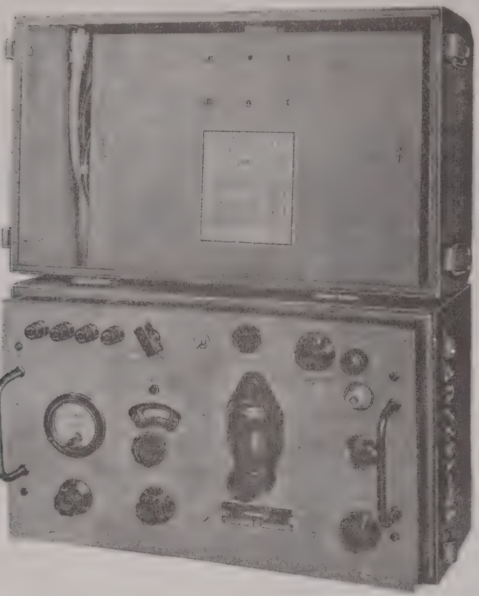
No. of Boxes	Contents & Identification	Volume (Cu. Ft.)	Over-all Dimensions (inches)			Weight Packed (Lbs.)
			H	W	D	
1	Test Set, TS-120/UP with accessories	7.19	23	20	27	170
1	Spare Parts	4.43	16	19-3/8	24-5/8	110
					Total:	280

TEST SET TS-120/UP
(TEST SET, RADAR, TS-120/UP)

EQUIPMENT SUPPLIED:

Quant. Per Eq'pt	Name and Nomenclature	Case Mat'l	Stock Numbers (USAF) (Navy) (Army)	Over-all Dimensions (inches)			Weight (Lbs.)
				H	W	D	
1	Test Set TS-120/UP	Metal	7CAC-801319-2642 F16-T-20134-6501 3F4325-120	13-1/8	21-5/8	16-1/4	60
1	Shock Mount Cradle			3-1/2	21-3/8	14-1/4	12
1	Accessories Box containing the following:			3-1/2	12-1/8	12-1/4	12.7
1	Video-Cable Assembly W-102		1800-132336680 1B102	72 ±3 long			
1	RF Coaxial W-106		3300-106350000 1A-106	72 ±3 long			
1	Adapter E-103						
1	Adapter E-108						
1	Pickup Horn E-104		3300-106330000				
1	Power Cord Assembly W-101		3300-082300 1B101	100 ±3 long			
1	Instruction Book						
1	Spare Parts Box	Metal					70.0
						Total:	154.7

TEST SET TS-147/UP
(TEST SET, RADAR, TS-147/UP)



FUNCTIONAL DESCRIPTION:

A portable unit designed for testing and adjusting beacon equipment and radar systems which operate within the frequency band 8500 to 9600 megacycles per second. Provides frequency modulated or continuous wave signals of known power level and frequency for radar receiver testing. Measures frequency, power, spectrum width, frequency fluctuation, T/R recovery time, and standing wave ratio of radio frequency signals. Continuous wave signals can be generated without an external trigger pulse; however, to generate frequency modulation signals the test set must be supplied with either a positive video signal or the radio frequency pulse from the radar transmitter.

The output is controlled directly by means of the power set attenuator and the output level is measured by the dbm attenuator. The dbm calibrated attenuator is a section of waveguide which contains a movable, rectangular, glass vane coated with resistive material. The position of this vane in the waveguide is proportional to the loss caused by attenuation, and serves in conjunction with the thermistor bridge wattmeter to indicate power level. The frequency meter is a cavity that is tuned to the test frequency by noting a dip in the bridge meter reading.

	AIR FORCE	NAVY	ARMY
TYPE CLASS.	Limited Standard		
STOCK NOS.	7CAC-801319-2365	F16-Q-303740-200	3F4325-147
PROCUREM'T INFO.:	Navy Spec. No. MIL-T-15254 (Ships), 1 June 1950		
PROCUREM'T COG.:	Navy		Navy, BuShips
F.I.I.N.:		FUNCTIONAL CLASS. NO.:	10.1.3
	- Electronics Test Equipment -		TS-147/UP

This project was supported by the USAF on Contract AF 33(600)28276 and monitored by WADC, ARDC - Carl L. Frederick, Bethesda, Md. - Multilithed in U. S. A.

TEST SET TS-147/UP
(TEST SET, RADAR, TS-147/UP)

RELATIONSHIP TO OTHER EQUIPMENT:

Superseded by Test Set TS-147A/UP.

Commercial Test Set by Sperry Gyroscope Company Model 38A is similar to TS-147/UP.

ELECTROMECHANICAL DESCRIPTION:

Circuit Information: Test signals are generated by the radio frequency oscillator using a reflex-Klystron tube, which is frequency modulated by the sawtooth voltage supplied by the triggered sweep generator. The sweep or sawtooth generator is a blocking-oscillator type of circuit that is caused to conduct by each positive trigger pulse applied to its grid. The sweep generator is triggered in synchronism with the system firing cycle either by means of voltage pulses connected to the trigger input receptacle or by means of pulse radio frequency power detected and amplified by the crystal and trigger amplifier.

Power Supply: 115 volts ±10%, AC, 50 to 1600 cycles per second, single phase, less than 125 watts.

Output Voltages Supplied by the Power Section:
- Plate Supply: +300 volts, electronic regulated.
- Reflector Supply: -210 volts, gas-tube regulated.
- Ripple: Less than 0. 1% peak of DC level.

Sawtooth Sweep:
- Amplitude: 0 to -100 volts.
- Slope: 0 to +2. 0 volts per microsecond.
- DC Level at Oscillator Reflector: -60 to -210 volts.
- Trigger Amplifier Gain: 500 approximately.

Signal Generator:
- Frequency Range: 8500 to 9600 megacycles per second.
- Power Output: -42 to -83 dbm.
- Type of Transmission: Frequency Modulated.
- Sweep Rate: 0 to 6 megacycles per microsecond.
- Deviation: 60 megacycles per second.
- RF Trigger Required for Sawtooth Sweep: 5 to 500 watts peak. 0.5 to 6 microsecond pulse width. 0. 5 microsecond pulse rise time.
- Video Trigger Required for Sawtooth Sweep: Positive polarity, 10 to 50 volts peak. 0. 5 to 20 microseconds pulse width at 10% maximum amplitude, less than 0.5 microseconds time of rise between 90% and 10% maximum amplitude points.

Frequency Meter:
- Frequency Range: 8500 to 9600 megacycles per second.
- Accuracy: ±2. 5 megacycles per second absolute, ±1. 0 megacycles per second for frequency increments of less than 60 megacycles relative, ±1.0 megacycles per second at 9310 megacycles per second calibration point. All accuracies measured at 25° C. and 60% relative humidity.

Accuracy can be improved by correcting for temperature and humidity.

TEST SET TS-147/UP
(TEST SET, RADAR, TS-147/UP)

ELECTROMECHANICAL DESCRIPTION: (Continued)

Power Meter:

Power Input Range: +7 to +30 dbm.
Power Output Range: -42 to -83 dbm.
Accuracy: ±2.0 dbm.

MANUFACTURERS' OR CONTRACTORS' DATA:

General Communications Company, Boston, Massachusetts; Contract No. NObsa-39114, Approximate Cost per Unit, $2140.00, February 1947; Contract No. NObsr-39296, Approximate Cost per Unit, $2048.00, June 1947.

TUBE COMPLEMENT:

2 JAN-OC3/VR-105, 1 JAN-5R4-GY, 2 JAN-6SL7GT, 1 JAN-6SH7, 1 JAN-6Y6-G, 1 JAN-2K25 or 723A/B, 1 JAN-1N23A (Crystal Rectifier).

REFERENCE DATA AND LITERATURE:

TO 16-35TS147-2 (Maintenance Instructions).
TM 11-1247 (Test Set TS-147/UP).
SIG 7 - TS-147/UP (Spare Parts Lists).
SIG 8 - TS-147/UP (Higher Echelon Spare Parts List).

SHIPPING DATA:

No. of Boxes	Contents & Identification	Volume (Cu. Ft.)	Overall Dimensions (inches)			Weight Packed (Lbs.)
			H	W	D	
1	Test Set, TS-147/UP and all equipment supplied (Wooden Case, Overseas)	2.68	16	12-3/4	22-3/4	65

EQUIPMENT SUPPLIED:

Quant. Per Eq'pt	Name and Nomenclature	Case Mat'l	Stock Numbers (USAF) (Navy) (Army)	Overall Dimensions (inches)			Weight (Lbs.)
				H	W	D	
1	Test Set TS-147/UP	Metal	7CAC-801319-2365 F16-Q-303740-200 3F4325-147	12-1/2	11	18-3/4	35.00
1	Horn AT-68/UP		7CAC-045705 3F3988-68	4-1/2	2-1/4	6-3/4	0.14
1	Cable Assembly Radio Frequency CG-92/U		7CAC-170265-42 1F430-92	96 long			1.25
1	Cord Assembly Power CX-337/U		7CAC-170264-86 3E6000-337-72	72 long			0.13

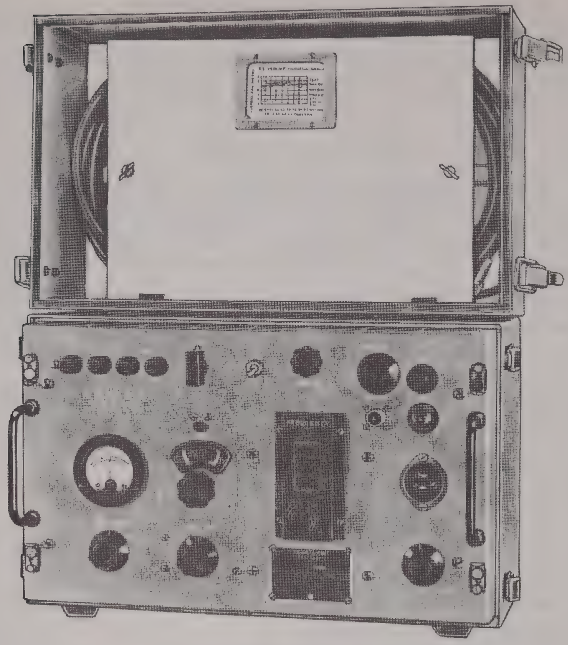
(Continued)

TEST SET TS-147/UP
(TEST SET, RADAR, TS-147/UP)

EQUIPMENT SUPPLIED: (Continued)

Quant. Per Eq'pt	Name and Nomenclature	Case Mat'l	Stock Numbers (USAF) (Navy) (Army)	Over-all Dimensions (inches)			Weight (Lbs.)
				H	W	D	
1	Cord CG-91/U		7CAC-170265-523	72 long			1.25
1	Adapter M-359		8850-107500				0.07
1	Spare Set Containing the following:						
1	Thermistor Mount						
5	Fuse, 2 ampere Type 3AG Cartridge						
9	Gasket, Waveguide Joints						
3	Lamp, 3.0 volts panel						
2	Crystal Rectifier 1N23A		3300-234137300 2J1N23A				

TEST SET TS-147A/UP
(TEST SET, RADAR, TS-147A/UP)



FUNCTIONAL DESCRIPTION:

A portable, general purpose unit used for testing and adjusting beacon equipment and radar systems. It provides frequency modulated or continuous wave signals of known power level and frequency for radar receiver testing and measures frequency, power, spectrum width, frequency fluctuation, T-R recovery time, and standing wave ratio of radio frequency signals. Continuous wave signals can be generated without an external trigger pulse; however, to generate frequency modulation signals the test set must be supplied with either a positive video signal or the radio frequency pulse from the radar transmitter.

The output is controlled directly by means of the power set attenuator and the output level is measured by the dbm attenuator. The dbm calibrated attenuator is a section of waveguide which contains a movable, rectangular, glass vane coated with resistive material. The position of this vane in the waveguide is proportional to the loss caused by attenuation, and serves in conjunction with the thermistor bridge wattmeter to indicate power level. The frequency meter is a cavity that is tuned to the test frequency by noting a dip in the bridge meter reading.

	AIR FORCE	NAVY	ARMY
TYPE CLASS.	Limited Standard		
STOCK NOS.	7CAC-801319-237	SNSN-F16-Q-303741-200	3F4325-147A
PROCUREM'T INFO.:	Navy Spec. No. MIL-T-15254 (Ships), 1 June 1950		
PROCUREM'T COG.:	Navy	DESIGN COG.:	Navy, BuShips
F.I.I.N.:		FUNCTIONAL CLASS. NO.:	10.1.3
	- Electronics Test Equipment -		TS-147A/UP

This project was supported by the USAF on Contract AF 33(600)28276 and monitored by WADC, ARDC - Carl L. Frederick, Bethesda, Md. - Multilithed in U. S. A.

TEST SET TS-147A/UP
(TEST SET, RADAR, TS-147A/UP)

RELATIONSHIP TO OTHER EQUIPMENT:

It is similar to TS-147/UP with the exception of a newly-designed oscillator housing, changes in the arrangement of components in the chassis, etc.

Commercial Test Set by General Communications Company, Model P-212 is similar to TS-147A/UP.

ELECTROMECHANICAL DESCRIPTION:

Circuit Information: Test signals are generated by the radio frequency oscillator using a reflex-Klystron tube, which is frequency modulated by the sawtooth voltage supplied by the triggered sweep generator. The sweep or sawtooth generator is a blocking-oscillator type of circuit that is caused to conduct by each positive trigger pulse applied to its grid. The sweep generator is triggered in synchronism with the system firing cycle either by means of voltage pulses connected to the trigger input receptacle or by means of pulse radio frequency power detected and amplified by the crystal and trigger amplifier.

Power Supply: 115 volts ±10%, AC, 50 to 1600 cycles per second, single phase, less than 125 watts.

Output Voltages Supplied by the Power Section:

Plate Supply: +300 volts, electronic regulated.

Reflector Supply: -210 volts, gas-tube regulated.

Ripple: Less than 0.1% peak of DC level.

Sawtooth Sweep:

Amplitude: 0 to -100 volts.

Slope: 0 to +2.0 volts per microsecond.

DC Level at Oscillator Reflector: -60 to -210 volts.

Trigger Amplifier Gain: 500 approximately.

Signal Generator:

Frequency Range: 8500 to 9600 megacycles per second.

Power Output: -42 to -83 dbm.

Output Impedance: 75 ohms.

Type of Transmission: Frequency Modulated, Continuous Wave.

Sweep Rate: 0 to 6 megacycles per microsecond.

Deviation: 0 to 60 megacycles per second.

Phase Range: 3 to 50 microseconds after trigger.

RF Trigger Required for Sawtooth Sweep: 5 to 500 watts peak. 0.5 to 6 microsecond pulse width. 0.5 microsecond pulse rise time.

Video Trigger Required for Sawtooth Sweep: Positive polarity, 10 to 50 volts peak. 0.5 to 20 microseconds pulse width at 10% maximum amplitude, less than 0.5 microseconds time of rise between 90% and 10% maximum amplitude points.

Accuracy: ±2 decibels.

Frequency Meter:

Frequency Range: 8500 to 9600 megacycles per second.

Accuracy: ±2.5 megacycles per second absolute, ±1.0 megacycle per second for frequency increments of less than 60 megacycles relative, ±1.0 megacycle per second at 9310 megacycles per second calibration point. All accuracies measured at 25° C. and 60% relative humidity.

Accuracy can be improved by correcting for temperature and humidity.

TEST SET TS-147A/UP
(TEST SET, RADAR, TS-147A/UP)

ELECTROMECHANICAL DESCRIPTION: (Continued)

Power Meter:

Power Input Range: +7 to +30 dbm.
Power Output Range: -42 to -83 dbm.
Accuracy: ±2.0 dbm.

MANUFACTURERS' OR CONTRACTORS' DATA:

General Communications Company, Boston, Massachusetts; Contract No. NObsr-43429, Approximate Cost per Unit, $1600.00.

TUBE COMPLEMENT:

2 JAN-OC3/VR-105, 1 JAN-5R4-GY, 2 JAN-6SL7GT, 1 JAN-6SH7, 1 JAN-6Y6-G, 1 JAN-2K25 or 723A/B, 1 JAN-1N23A (Crystal Rectifier).

REFERENCE DATA AND LITERATURE:

TO 16-35TS147-11 (Operation and Service Instructions with Parts List).

SHIPPING DATA:

No. of Boxes	Contents & Identification	Volume (Cu. Ft.)	Overall Dimensions (inches)			Weight Packed (Lbs.)
			H	W	D	
1	Test Set, TS-147A/UP and all equipment supplied (Wooden Case, Overseas)	2.68	16	12-3/4	22-3/4	65

EQUIPMENT SUPPLIED:

Quant. Per Eq'pt	Name and Nomenclature	Case Mat'l	Stock Numbers (USAF) (Navy) (Army)	Overall Dimensions (inches)			Weight (Lbs.)
				H	W	D	
1	Test Set TS-147A/UP	Metal	7CAC-801319-237 F16-Q-303741-200 3F4325-147A	12-1/4	11	18-3/4	35.00
1	Horn AT-68/UP		7CAC-045705 N16-H-88041-2151 3F3988-68	4-1/2	2-1/4	6-3/4	0.14
1	Cable Assembly Radio Frequency CG-92B/U		7CAC-170265-6 1F430-92	96 long			1.25

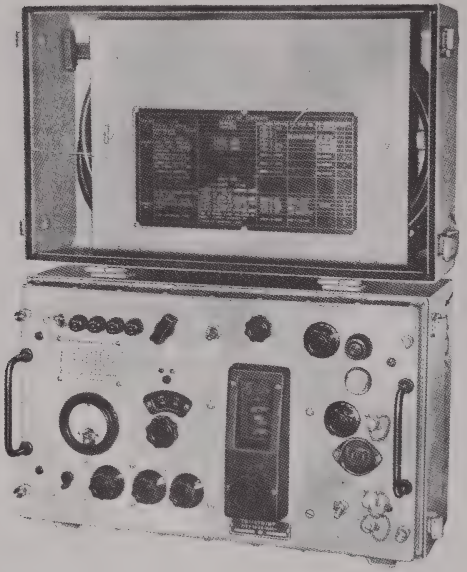
(Continued)

TEST SET TS-147A/UP
(TEST SET, RADAR, TS-147A/UP)

EQUIPMENT SUPPLIED: (Continued)

Quant. Per Eq'pt	Name and Nomenclature	Case Mat'l	Stock Numbers (USAF) (Navy) (Army)	Over-all Dimensions (inches)			Weight (Lbs.)
				H	W	D	
1	Cord Assembly Power CX-337/U		7CAC-170264-86 3E6000-337.72	72 long			0.13
1	Cord CG-91/U		7CAC-170265-523	72 long			1.25
1	Coaxial Cable Fitting, Navy Type 49192						
1	Spare Set Containing the following:						
1	Thermistor Mount						
5	Fuse, 2 Ampere Type 3AG Cartridge						
9	Gasket, Waveguide Joints						
3	Lamp, 3.0 volts panel						
3	Crystal Rectifier 1N23A		3300-234137300 2J1N23A				

TEST SET TS-147D/UP
(TEST SET, RADAR, TS-147D/UP



FUNCTIONAL DESCRIPTION:

A portable, general purpose unit used for testing and adjusting beacon equipment and radar systems. It provides frequency modulated or continuous wave signals of known power level and frequency for radar receiver testing and measures frequency, power, spectrum width, frequency fluctuation, T-R recovery time, and standing wave ratio of radio frequency signals. The test set has a provision to allow for external modulation to produce a pulsed radio frequency signal.

The output is controlled directly by means of the power set attenuator and the output level is measured by the dbm attenuator. The dbm calibrated attenuator is a section of waveguide which contains a movable, rectangular, glass vane coated with resistive material. The position of this vane in the waveguide is proportional to the loss caused by attenuation, and serves in conjunction with the thermistor bridge wattmeter to indicate power level. The frequency meter is a cavity that is tuned to the test frequency by noting a dip in the bridge meter reading.

	AIR FORCE	NAVY	ARMY
TYPE CLASS.			
STOCK NOS.	7CAC-801319-22315		3F4325-147D
PROCUREM'T INFO.:	Navy Spec. No. MIL-T-15254A (Ships).		
PROCUREM'T COG.:	Navy	DESIGN COG.:	Navy, BuShips
F.I.I.N.:		FUNCTIONAL CLASS. NO.:	10.1.3
- Electronics Test Equipment -			TS-147D/UP

This project was supported by the USAF on Contract AF 33(600)28276 and monitored by WADC, ARDC - Carl L. Frederick, Bethesda, Md. - Multilithed in U. S. A.

TEST SET TS-147D/UP
(TEST SET, RADAR, TS-147D/UP)

RELATIONSHIP TO OTHER EQUIPMENT:

ELECTROMECHANICAL DESCRIPTION:

Circuit Information: Test signals are generated by the radio frequency oscillator using a reflex-Klystron tube, which is frequency modulated by the sawtooth voltage supplied by the triggered sweep circuit or pulse modulated by the voltages supplied by an external pulse circuit. The sweep or sawtooth generator is a blocking-oscillator type of circuit that is caused to conduct by each positive trigger pulse applied to its grid. The sweep generator is triggered in synchronism with the system firing cycle either by means of voltage pulses connected to the trigger input receptacle or by means of pulse radio frequency power detected and amplified by the crystal and trigger amplifier.

Power Supply: 115 volts ±10 volts, AC, 59 to 1600 cycles per second, single phase; approximately 125 watts operating, approximately 25 watts standby.

Output Voltages Supplied by the Power Section:
- Plate Supply: +600 volts.
- Reflector Supply: -60 to -210 volts.
- Ripple: Less than 0.1% peak of DC level.

Sawtooth Sweep:
- Amplitude: 0 to -100 volts.
- Slope: 0 to +2.0 volts per microsecond.
- DC Level at Oscillator Reflector: -60 to -210 volts.
- Trigger Amplifier Gain: 500 approximately.

Impedances:
- Trigger Input: Over 10,000 ohms.
- RF Output at Connector: 50 ohms over range of 8500 to 9600 megacycles per second.

Signal Generator:
- Frequency Range: 8500 to 9600 megacycles per second.
- Power Output: -7 to -85 dbm.
- Type of Transmission: Frequency Modulated, Pulsed Modulated, Continuous Wave.
- Sweep Rate: 0 to 6 megacycles per microsecond.
- Deviation: 0 to over 40 megacycles per second.
- Phase Range: 3 to 50 microseconds after trigger.
- Pulse Repetition Rate: To 4000 pulses per second.
- RF Trigger Required for Sawtooth Sweep: 5 to 500 watts peak. 0.2 to 6 microsecond duration. 0.5 microsecond pulse rise time.
- Video Trigger Required for Sawtooth Sweep: Positive polarity, 10 to 50 volts peak. 0.5 to 20 microseconds duration at 10% maximum amplitude, less than 0.5 microsecond rise time between 90% and 10% maximum amplitude points.
- Accuracy: ±1.5 decibels.

Frequency Meter:
- Frequency Range: 8470 to 9630 megacycles per second.

(Continued)

TEST SET TS-147D/UP
(TEST SET, RADAR, TS-147D/UP)

ELECTROMECHANICAL DESCRIPTION: (Continued)

Accuracy: ±2.5 megacycles per second absolute, ±1.0 megacycle per second for frequency increments of less than 60 megacycles relative, ±1.0 megacycle per second at 9310 megacycles per second calibration point. All accuracies measured at 25° C. and 60% relative humidity.

Accuracy can be improved by correcting for temperature and humidity.

Power Meter:

Power Input Range: +7 to +30 dbm.

Power Output Range: -7 to -85 dbm.

Accuracy: ±1.5 decibels.

MANUFACTURERS' OR CONTRACTORS' DATA:

General Communication Company, Boston, Massachusetts; Contract Nos. NObsr-52607 dated 25 June 1951 and NObsr-57567 dated 30 June 1952.

TUBE COMPLEMENT:

2 JAN-OC3/VR-105, 1 JAN-5R4GY, 2 JAN-6SL7GT, 1 JAN-6SH7, 1 JAN-6Y6G, 1 JAN-2K25, 1 JAN-1N23A (Crystal Rectifier).

REFERENCE DATA AND LITERATURE:

TO 16-35TS147-15 (NavShips 91716) (Instruction Book).

SHIPPING DATA:

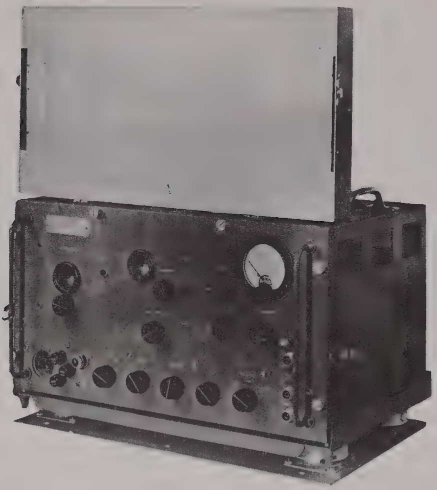
No. of Boxes	Contents & Identification	Volume (Cu. Ft.)	Over-all Dimensions (inches)			Weight Packed (Lbs.)
			H	W	D	
1	Test Set TS-147D/UP, and all equipment supplied (Export Packed)	3.7	17	15-1/2	24-3/10	76

TEST SET TS-147D/UP
(TEST SET, RADAR, TS-147D/UP)

EQUIPMENT SUPPLIED:

Quant. Per Eq'pt	Name and Nomenclature	Case Mat'l	Stock Numbers (USAF) (Navy) (Army)	Over-all Dimensions (inches)			Weight (Lbs.)
				H	W	D	
1	Test Set TS-147D/UP Including:	Metal	7CAC-801319-22315 3F4325-147D	13	11-4/5	19-1/2	47.0
1	Pickup Antenna AT-68/UP		7CAC-045705 NI6-H-88041-2151 3F3988-68	4-1/2	6-4/5	2-3/10	0.3
1	Cord CG-92A/U		7CAC-170265-425 3E6015-92A.96	96 long			1.0
1	Cord CX-337/U		7CAC-170264-86 3E6000-337.72	72 long			0.5
1	RF Cable Assembly CG-530/U			72 long			0.7
1	Adapter UG-273/U		8850-102000				0.2
1	Adapter Connector UG-397/U						0.2
1	Adapter Connector UG-446/U		7CAC-222470 2Z308-446				0.2
1	Case CY-1302A/UP			13	11-4/5	19-1/2	
2	Instruction Book NavShips 91716						

TEST SET TS-191/UP



FUNCTIONAL DESCRIPTION:

A portable, general purpose signal generator used with radar and radar-beacon equipment. The test set functions as a signal generator, frequency meter, and wattmeter, and is used for measuring and adjusting the radar equipment. The set will measure output frequency, power, local oscillator frequency, receiver sensitivity, and IF bandwidth. Test resultsare obtained by means of a meter mounted on the front panel.

RELATIONSHIP TO OTHER EQUIPMENT:

The TS-191/U is similar to the TS-120/UP except for operating range. Both test sets can be used in conjunction with the Standing-Wave Indicator TS-12/AP to measure voltage standing-wave ratio. These test sets have been superseded by TS-642/U.

ELECTROMECHANICAL DESCRIPTION:

Circuit Information: The test set includes a built-in pulse modulator which supplies

(Continued)

	AIR FORCE	NAVY	ARMY
TYPE CLASS.		Limited Standard	
STOCK NOS.	1690-327879467	F16-O-303558-200	3F4325-120
PROCUREM'T INFO.:			
PROCUREM'T COG.:		DESIGN COG.:	Navy, BuShips
F.I.I.N.:		FUNCTIONAL CLASS. NO.:	10.1.3
	- Electronics Test Equipment -		TS-191/UP

TEST SET TS-191/UP

ELECTROMECHANICAL DESCRIPTION: (Continued)

modulation signals for square wave and short pulse outputs. Provision is made for triggering the internal pulses by means of an external trigger of either polarity. It is possible to obtain a frequency modulated output signal by means of an external sawtooth wave.

Power Supply: 115 volts, AC, ±10%, 50 to 800 cycles per second, single-phase, 157.5 watts at 60 cycles per second.

Frequency Range: 8990 to 9170 megacycles per second.

Type of Transmission: CW, short pulse, and square-wave modulated carrier.

Accuracies: ±2 megacycles, ±1.5 decibel at 77°F.

Modulation Frequency: 1200 cycles per second square wave.

Pulse Width: 0.2 to 0.5 microsecond, 1 to 2 microseconds.

Pulse Delay: 10 to 200 microseconds variable; 0 microsecond (approximately) fixed.

Power Output: 0 to 77 decibels below 1 milliwatt peak pulse.

Power Input: 5 to 32 decibels above 1 milliwatt average.

Video Output: 10 to 15 volts negative.

Output Impedance: 50 ohms.

Synchronization: Internal for squarewave output only; 200 to 2500 cycles per second, positive trigger 25 to 200 volts peak or negative trigger 30 to 200 volts peak, on short pulse only.

MANUFACTURERS' OR CONTRACTORS' DATA:

Airadio, Incorporated, Stamford, Connecticut; Contract No. NSxm-69247.

TUBE COMPLEMENT:

REFERENCE DATA AND LITERATURE:

USAF TO 16-35TS120-5 (Maintenance Instructions).

USAF TO 16-55-33 (Spare Parts List).

SHIPPING DATA:

No. of Boxes	Contents & Identification	Volume (Cu. Ft.)	Overall Dimensions (inches)			Weight Packed (Lbs.)
			H	W	D	
	Test Set TS-191/UP					

TEST SET TS-191/UP

EQUIPMENT SUPPLIED:

Quant. Per Eq'pt	Name and Nomenclature	Case Mat'l	Stock Numbers (USAF) (Navy) (Army)	Overall Dimensions (inches)			Weight (Lbs.)
				H	W	D	
1	Test Set TS-191/UP	metal		13-1/8	21-5/8	16-1/4	60

TEST SET TS-223/AP
(TEST SET, RADAR, TS-223/AP)

FUNCTIONAL DESCRIPTION:

A portable, general purpose, test set consisting of an absorption type frequency meter, a power meter and a signal generator. It is designed to measure the transmitter frequency and output power, but in addition, it will check the frequency of the local oscillator, receiver alignment, sensitivity, receiver bandwidth, and receiver automatic frequency control.

Resonance is indicated by a dip in the resonance-indicating meter. Frequency is calculated from the dial setting of the resonant cavity. Input and output power are calculated by adding the attenuator setting to the reading of the meter which reads in decibels below 1 milliwatt.

RELATIONSHIP TO OTHER EQUIPMENT:

	AIR FORCE	NAVY	ARMY
TYPE CLASS.			
STOCK NOS.	7CAC-801319-2236	ASO-R16-AN-TS-223/AP	3F4325-223
PROCUREM'T INFO.: Navy Spec. No. 16T15-(RE)			
PROCUREM'T COG.: Navy		DESIGN COG.: Navy, BuAer	
F.I.I.N.:		FUNCTIONAL CLASS. NO.: 10.1.3	
- Electronics Test Equipment -			TS-223/AP

This project was supported by the USAF on Contract AF 33(600)28276 and monitored by WADC, ARDC - Carl L. Frederick, Bethesda, Md. - Multilithed in U. S. A.

TEST SET TS-223/AP
(TEST SET, RADAR, TS-223/AP)

ELECTROMECHANICAL DESCRIPTION:

Power Supply: 110 to 120 volts, AC, 50 to 1600 cycles per second, single phase, 80 watts.

Input:

Frequency Range: 23,500 to 24,500 megacycles per second.

Power Range: +10 to +30 dbm (from directional coupler probe). The unit may also be triggered by a radio frequency signal having a pulse width of 0.1 microseconds at 0.25 kilowatt peak power or by a signal having a pulse width of 0.25 microseconds at 0.10 kilowatt peak power.

Impedance: Two flexible waveguide sections (8 inches) are supplied in order to connect the test set to the directional coupler in the transmitter waveguide. One end consists of a choke flange; the other end is a plain flange for coupling to Army-Navy Type UG-116/U and UG-117/U Choke Flanges.

Output:

Frequency Range: 23,500 to 24,500 megacycles per second.

Power Range: Frequency Modulated or Continuous Wave, -40 to -85 dbm. The radio frequency output signal is frequency modulated by an internal sawtooth voltage applied to the reflector element of the oscillator tube. When this sweep voltage is triggered by a pulse of 50 microseconds duration, it produces a pulse of 4 to 6 megacycles per second duration.

Impedance: Same as impedance input.

Attenuator Calibration: "Transmitter Test", +10 to +30 dbm. "Receiver Test", -40 to -85 dbm.

Accuracy:

Relative Frequency: ±2 megacycles per second for frequencies between points not more than 120 megacycles per second apart. (A separate internal frequency meter is provided for this purpose.)

Absolute Frequency: ±30 megacycles per second absolute (input or output).

Power Output: ±3 decibels (input or output).

Attenuator: ±1 decibel.

Temperature Range: -40° C. to +50° C.

Receiver Sensitivity: -37 to -90 dbm.

MANUFACTURERS' OR CONTRACTORS' DATA:

Aircraft Radio Corporation, Boonton, New Jersey; Navy Contract Nos. NXsa-62363; NXsa-85016, and NXsa-11835; Approximate Cost per Unit, $1250.00; Order No. 240-DAY-45, 15 August 1944.

TUBE COMPLEMENT:

1 JAN-2K50 (or 1462), 2 JAN-6SL7GT, 1 JAN-5R4GY, 1 JAN-1478 (or 2A21), 1 JAN-6Y6, 1 JAN-6SH7, 1 JAN-OD3/VR-150.

REFERENCE DATA AND LITERATURE:

TEST SET TS-223/AP
(TEST SET, RADAR, TS-223/AP)

SHIPPING DATA:

No. of Boxes	Contents & Identification	Volume (Cu. Ft.)	Overall Dimensions (inches)			Weight Packed (Lbs.)
			H	W	D	
1	Test Set, TS-223/AP with accessories (Export Packed, MFP)	2.20	13	24	14	90

EQUIPMENT SUPPLIED:

Quant. Per Eq'pt	Name and Nomenclature	Case Mat'l	Stock Numbers (USAF) (Navy) (Army)	Overall Dimensions (inches)			Weight (Lbs.)
				H	W	D	
1	Test Set TS-223/AP (Complete)	Metal	7CAC-801319-2236 R16-AN-TS-223/AP 3F4325-223	10-1/4	15	9-3/8	24
2	Adapter UG-255/U		8850-108880 R16-A-507 2Z308-255				
2	Adapter UG-273/U		8850-102000 R16-A-478 2Z308-273				
1	Coupler CU-127/UP		R16-AN-CU-127/UP				
1	Waveguide CG-345/U		R16-AN-CG-345/U 2Z10006-345				
1	Waveguide CG-346/U		R16-AN-CG-346/U 2Z10006-346				
1	Cable CG-409A/U		7CAC-170265-24 R16-C-3761 3E6015-409A-72	72 long			
1	Cable CX-337/U		7CAC-170264-86 R16-AN-CX-337/U 3E6000-337-72	72 long			
2	Waveguide UG-344/U		R16-AN-UG-344/U				

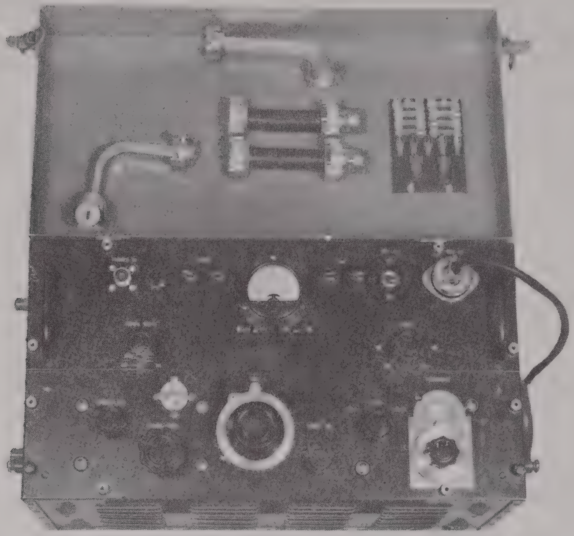
(Continued)

TEST SET TS-223/AP
(TEST SET, RADAR, TS-223/AP)

EQUIPMENT SUPPLIED: (Continued)

Quant. Per Eq'pt	Name and Nomenclature	Case Mat'l	Stock Numbers (USAF) (Navy) (Army)	Over-all Dimensions (inches)			Weight (Lbs.)
				H	W	D	
1	Instruction Book						
1	Carrying Case CY-138/AP		R16-AN-CY-438/AP 3F2529-438	12-3/4	18-3/4	13	14
1	Set Operating Spares						
						Total:	40

SIGNAL GENERATOR TS-259/AP
(GENERATOR, SIGNAL, TS-259/AP)



FUNCTIONAL DESCRIPTION:

A portable, general purpose unit used to tune radar receivers, check automatic frequency control circuits, measure receiver sensitivity and bandwidths, measure radar transmitter power output and frequency, and measure T/R recovery time. Frequency and power are directly indicated on calibrated dials located on the front panel.

RELATIONSHIP TO OTHER EQUIPMENT:

Superseded by TS-259A/AP.

ELECTROMECHANICAL DESCRIPTION:

Circuit Information: Consists of a 2K-33 radio frequency oscillator, sweep generator (which is triggered by the radar transmitter pulse or an external trigger), the output of which is applied to the reflector of the radio frequency oscillator and modulates the frequency of the radio frequency output; a thermistor bridge

(Continued)

	AIR FORCE	NAVY	ARMY
TYPE CLASS.	Limited Standard		
STOCK NOS.	1690-329001370		3F4325-259
PROCUREM'T INFO.:			
PROCUREM'T COG.: USAF		DESIGN COG.: USAF, ARL	
F.I.I.N.:		FUNCTIONAL CLASS. NO.: 10.1.3	
	- Electronics Test Equipment -		TS-259/AP

This project was supported by the USAF on Contract AF 33(600)28276 and monitored by WADC, ARDC - Carl L. Frederick, Bethesda, Md. - Multilithed in U. S. A.

SIGNAL GENERATOR TS-259/AP
(GENERATOR, SIGNAL, TS-259/AP)

ELECTROMECHANICAL DESCRIPTION: (Continued)

to measure the power output of the radio frequency oscillator of the test set or the power input to the test set; two attenuators (one calibrated); a reaction type frequency meter; and a radio frequency switch for output or input measurements.

Power Supply: 115 volts ±10%, AC, 50 to 1600 cycles per second, single phase, 120 watts approximately.

Frequency Range: 23,500 to 24,500 megacycles per second.

Type of Transmission: Frequency Modulated Carrier, Pulsed, Continuous Wave.

Power Output Range: -40 to -80 dbm.

Power Input Range: +10 to +50 dbm.

Temperature Range: -40° C. to +55° C.

Humidity Range: 0 to 95% relative humidity.

Accuracy: Frequency ±2%.
Power Output ±2 decibels.

MANUFACTURERS' OR CONTRACTORS' DATA:

Browning Laboratories, Inc., Winchester, Massachusetts.

TUBE COMPLEMENT:

1 JAN-1N26, 1 JAN-6X5GT, 3 JAN-OD3/VR-150, 1 JAN-6SL7GT, 1 JAN-6SN7GT, 1 2K-33, 1 JAN-3B24, 1 JAN-6SH7GT, 2 JAN-3D21.

REFERENCE DATA AND LITERATURE:

TO 16-35TS259-3 (Maintenance Instructions).

SHIPPING DATA:

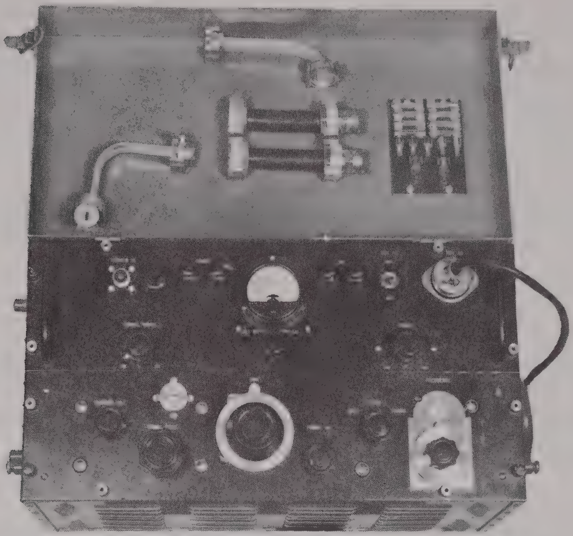
No. of Boxes	Contents & Identification	Volume (Cu. Ft.)	Over-all Dimensions (inches)			Weight Packed (Lbs.)
			H	W	D	

SIGNAL GENERATOR TS-259/AP
(GENERATOR, SIGNAL, TS-259/AP)

EQUIPMENT SUPPLIED:

Quant. Per Eq'pt	Name and Nomenclature	Case Mat'l	Stock Numbers (USAF) (Navy) (Army)	Over-all Dimensions (inches)			Weight (Lbs.)
				H	W	D	
1	Signal Generator, TS-259/AP (Complete)		1690-329001370 3F4325-259	18-1/2	11-1/2	9-1/2	40
2	Flexible Waveguide CG-344/U		2Z10006-344	9 long			
1	Cord (Power) CX-234/AP		7CAC-170264-48 3E6000-234	120 long			
1	Cord (Adapter) CX-790/U		7CWX-BL438942 3E6000-790.10	6-1/2 long			
1	Curved Rigid Transmission Line (E Plane) CG-345/U		2Z10006-345	2 long			
1	Curved Rigid Transmission Line (H Plane) CG-346/U		2Z10006-346	2 long			

SIGNAL GENERATOR TS-259A/AP
(GENERATOR, SIGNAL, TS-259A/AP)



FUNCTIONAL DESCRIPTION:

A portable, general purpose unit used to tune radar receivers, check automatic frequency control circuits, measure receiver sensitivity and bandwidths, measure radar transmitter power output and frequency, and measure T/R recovery time. Frequency and power are directly indicated on calibrated dials located on the front panel.

RELATIONSHIP TO OTHER EQUIPMENT:

Part of Radar Test Set AN/TPM-4. Used with but not part of Radar Set AN/TPQ-2. Similar to Signal Generator TS-259/AP except for improved carrying case. Operationally similar to TS-223/AP. Also used with AN/APS-32, AN/APS-34, and AN/APQ-34.

ELECTROMECHANICAL DESCRIPTION:

Circuit Information: Consists of a 2K-33 radio frequency oscillator, sweep generator (which is triggered by the radar transmitter pulse or an external trigger),

(Continued)

	AIR FORCE	NAVY	ARMY
TYPE CLASS.			
STOCK NOS.			3F4325-259A
PROCUREM'T INFO.: USAF Spec. TTK-1RH			
PROCUREM'T COG.: USAF		DESIGN COG.: USAF, ARL	
F.I.I.N.:		FUNCTIONAL CLASS. NO.: 10.1.3	
- Electronics Test Equipment -			TS-259A/AP

This project was supported by the USAF on Contract AF 33(600)28276 and monitored by WADC, ARDC - Carl L. Frederick, Bethesda, Md. - Multilithed in U. S. A.

SIGNAL GENERATOR TS-259A/AP
(GENERATOR, SIGNAL, TS-259A/AP)

ELECTROMECHANICAL DESCRIPTION: (Continued)

the output of which is applied to the reflector of the radio frequency oscillator and modulates the frequency of the radio frequency output; a thermistor bridge to measure the power output of the radio frequency oscillator of the test set or the power input to the test set; two attenuators (one calibrated); a reaction type frequency meter; and a radio frequency switch for output or input measurements.

Power Supply: 115 volts ±10%, AC, 50 to 1600 cycles per second, single phase, 120 watts approximately.

Frequency Range: 23,500 to 24,500 megacycles per second.

Type of Transmission: Frequency Modulated Carrier, Pulsed, Continuous Wave.

Power Output Range: -40 to -80 decibels.

Power Input Range: +10 to +50 decibels.

Temperature Range: -40° C. to +55° C.

Humidity Range: 0 to 95% relative humidity.

Accuracy: ±2%, indicated frequency.
±2 dbm, power output.

MANUFACTURERS' OR CONTRACTORS' DATA:

Browning Laboratories, Inc., Winchester, Massachusetts.

TUBE COMPLEMENT:

1 JAN-6X5GT, 3 JAN-OD3/VR-150, 1 JAN-6SL7GT, 1 JAN-6SN7GT, 1 JAN-6L6GA, 1 2K33, 1 JAN-3B24, 1 JAN-6SH7GT, 1 JAN-1N26 (Crystal).

REFERENCE DATA AND LITERATURE:

SHIPPING DATA:

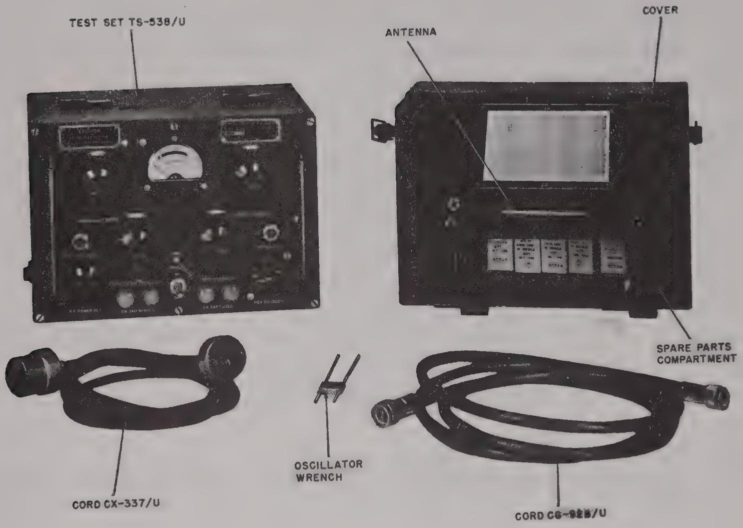
No. of Boxes	Contents & Identification	Volume (Cu. Ft.)	Over-all Dimensions (inches)			Weight Packed (Lbs.)
			H	W	D	

SIGNAL GENERATOR TS-259A/AP
(GENERATOR, SIGNAL, TS-259A/AP)

EQUIPMENT SUPPLIED:

Quant. Per Eq'pt	Name and Nomenclature	Case Mat'l	Stock Numbers (USAF) (Navy) (Army)	Over-all Dimensions (inches)			Weight (Lbs.)
				H	W	D	
1	Signal Generator TS-259A/AP	Sheet Steel	3F4325-259A	15	10	8	30
1	Transit Case	Skydyne					15
1	Transmission Line CG-344/U		2Z10006-344	9 long			
1	Transmission Line CG-345/U		2Z10006-345	2 long			
1	Transmission Line CG-346/U		2Z10006-346	2 long			
1	Cord CX-234/AP		7CAC-170264-48 3E6000-234				
1	Cord CX-790/U		7CWX-BL438942 3E6000-790.10	6-1/2 long			

TEST SET TS-538/U



FUNCTIONAL DESCRIPTION:

A portable, special purpose, test instrument designed for use as a signal generator, frequency meter, and power monitor. It is used for testing the operation of radiosonde equipment and may also be used to check the power output of transmitters and the bandwidth, alignment, and sensitivity of receivers operating within its frequency range.

Indication is on a frequency meter knob in megacycles per second, an oscillator frequency knob in megacycles per second, an output power knob in -dbm, a repetition rate knob in cycles per second, and a power monitor meter dial calibrated at the midpoint for set power level and at its lower end to indicate bad operation of either the crystal rectifier in the instrument or of a set being tested.

This instrument is used in field and depot testing.

RELATIONSHIP TO OTHER EQUIPMENT:

This equipment is specifically designed for testing Radiosonde AN/AMT-4, and Rawin Set AN/GMD-1.

	AIR FORCE	NAVY	ARMY
TYPE CLASS.			
STOCK NOS.	7CAC-801319-2643		3F4325-538
PROCUREM'T INFO.: Spec. MIL-T-10151(SigC) dated 20 February 1950			
PROCUREM'T COG.: Army		DESIGN COG.: Army, ESL	
F.I.I.N.:		FUNCTIONAL CLASS. NO.: 10.1.3	
- Electronics Test Equipment -			TS-538/U

This project was supported by the USAF on Contract AF 33(600)28276 and monitored by WADC, ARDC - Carl L. Frederick, Bethesda, Md. - Multilithed in U. S. A.

TEST SET TS-538/U

ELECTROMECHANICAL DESCRIPTION:

Circuit Information: Circuity consists of an antenna lead-in, a Colpitts RF oscillator, a blocking oscillator to trigger a multivibrator, a cathode follower to match multivibrator output to the RF oscillator output for modulation, a turntable cavity absorption type frequency meter, a crystal rectifier, a power monitor meter (DC milliammeter), and a power attenuator.

Power Supply: 117 volts, ±10% AC, 50 to 1600 cycles per second, single phase.

Frequency Range: 1630 to 1730 megacycles per second.

Type of Transmission: Continuous Wave, Pulse Modulated.

Power Output: -20 to -107 dbm, calibrated.

Power Monitor Sensitivity: 150 to 250 milliwatts at 10 inches.

Internal Modulation Pulse Repetition Rate: 5 to 200 pulses per second.

Internal Modulation Pulse Width: 50 microseconds ±10 microseconds.

RF Leakage: 4×10^{-12} watts, maximum.

Attenuator Accuracy: ±1 dbm from -20 to -70 dbm, ±3 dbm from -70 to -107 dbm.

Frequency Meter Accuracy: ±2 megacycles per second.

Temperature Range: -40° C. to $+55^{\circ}$ C. operational, -54° C. to $+65.5^{\circ}$ C. non-operational.

Humidity Range: Up to 100% operational.

Altitude Range: Sea level to 5000 feet, operational. Sea level to 40,000 feet, non-operational.

MANUFACTURERS' OR CONTRACTORS' DATA:

Allen B. Cardwell Company, 97 Whiting Street, Plainville, Connecticut; Army SigC Orders 11383-PHILA-47, 7078-PHILA-48, 9158-PHILA-49.

TUBE COMPLEMENT:

3 JAN-6J6, 1 JAN-A2352, 1 JAN-6X4, 1 JAN-1N23B, 1 JAN-OB2.

REFERENCE DATA AND LITERATURE:

TO 16-40TS538-5 (TM 11-5014) (Instruction Book).

SHIPPING DATA:

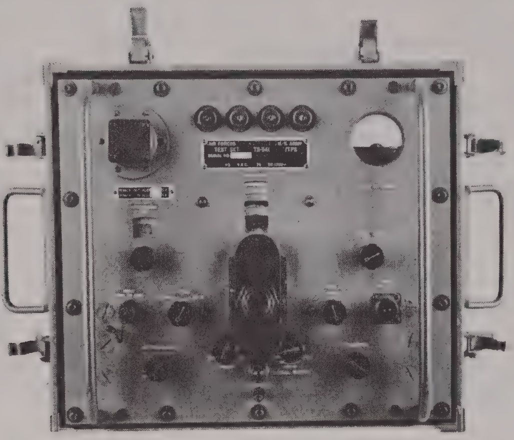
No. of Boxes	Contents & Identification	Volume (Cu. Ft.)	Over-all Dimensions (inches)			Weight Packed (Lbs.)
			H	W	D	
1	Test Set TS-538/U (Export Packed)	2.72	14-1/2	18-1/2	17-1/2	50

TEST SET TS-538/U

EQUIPMENT SUPPLIED:

Quant. Per Eq'pt	Name and Nomenclature	Case Mat'l	Stock Numbers (USAF) (Navy) (Army)	Over-all Dimensions (inches)			Weight (Lbs.)
				H	W	D	
1	Test Set TS-538/U Including:	Metal	7CAC-801319-2643 3F4325-538	8-3/16	11-15/16	11-11/16	23.5
1	Antenna			3-3/4 long	3/16 dia.		0.1
1	Cord CX-337/U		7CAC-170264-86 3E6000-337-72	72 long			0.5
1	Cord CG-92B/U		7CAC-170265-6	84 long			1.2
1	Cover			8-3/16	11-15/16	8	
4	Fuse FU-27 (2 spares)						
1	Special Wrench						
1	Set Tubes						
1	Spare Set Tubes						
2	Handbook TM 11-5014						

TEST SET TS-541/TPS
(TEST SET, RADAR, TS-541/TPS)



FUNCTIONAL DESCRIPTION:

A portable unit designed for field or laboratory measurements of radar equipment. Performance checks on radar transmitter frequency, power output and spectrum, radar receiver sensitivity, frequency, bandwidth and recovery time, magnetron pulling and AFC circuit check, and AFC discriminator alignment. Frequency dial is calibrated 843 to 966. To obtain frequency in megacycles per second, multiply dial reading by ten. All controls and dials are located on the front panel.

RELATIONSHIP TO OTHER EQUIPMENT:

Similar to TS-147/UP.
Used to test AN/TPS-10B and AN/FPN-17.

ELECTROMECHANICAL DESCRIPTION:

Circuit Information: Consists of a sawtooth wave generator, a radio frequency oscillator with plumbing, radio frequency, power level bridge wavemeter, a power

(Continued)

	AIR FORCE	NAVY	ARMY
TYPE CLASS.	Standard		
STOCK NOS.	7CAC-801319-226		3F4325-541
PROCUREM'T INFO.: USAF Spec. No. 7483-B			
PROCUREM'T COG.: USAF		DESIGN COG.: USAF, Rome	
F.I.I.N.:		FUNCTIONAL CLASS. NO.: 10.1.3	
- Electronics Test Equipment -			TS-541/TPS

This project was supported by the USAF on Contract AF 33(600)28276 and monitored by WADC, ARDC - Carl L. Frederick, Bethesda, Md. - Multilithed in U. S. A.

TEST SET TS-541/TPS
(TEST SET, RADAR, TS-541/TPS)

ELECTROMECHANICAL DESCRIPTION: (Continued)
level monitoring meter, two radio frequency attenuators (calibrated) directional coupler assembly, power supply voltage controls, and inverter.

Power Supply: 110 volts ±10%, AC, 50 to 1200 cycles per second, single phase, 7 to 100 watts.

Frequency Range: 8500 to 9500 megacycles per second.

Frequency Modulation: Can be frequency modulated through the radar receiver a the repetition rate of the radar transmitter. Amplitude and phase adjustable.

Type of Transmission: Pulsed Carrier, Frequency Modulated, and Continuous Wave.

Power Output: -40 to -90 dbm average power.

Power Measuring Range: 20 to +95 dbm when used with 25 decibel directional coupler assembly.

MANUFACTURERS' OR CONTRACTORS' DATA:

Sylvania Electric Products, Inc., Electronics Division, Boston, Massachusetts; Development Contract No. W28-099ac-182; Total Cost, $10,500.00, March 1948.

Espey Manufacturing Company, Inc., New York, New York; Production Contract No. AF 33(038)7949; Approximate Cost per Unit, $2,500.00.

TUBE COMPLEMENT:

1 JAN-5R4GY, 3 JAN-OD3/VR150, 1 JAN-6J5GT, 1 JAN-2K25, 1 JAN-884.

REFERENCE DATA AND LITERATURE:

TO 16-35TS541-2 (Operation and Service Instructions).
TO 16-35TS541-3 (Maintenance Instructions).
TO 16-35TS541-4 (Parts Catalog).

SHIPPING DATA:

No. of Boxes	Contents & Identification	Volume (Cu. Ft.)	Over-all Dimensions (inches)			Weight Packed (Lbs.)
			H	W	D	

TEST SET TS-541/TPS
(TEST SET, RADAR, TS-541/TPS)

EQUIPMENT SUPPLIED:

Quant. Per Eq'pt	Name and Nomenclature	Case Mat'l	Stock Numbers (USAF) (Navy) (Army)	Over-all Dimensions (inches) H	W	D	Weight (Lbs.)
1	Test Set TS-541/TPS		7CAC-801319-226 3F4325-541	13-1/2	15-3/4	14-1/2	55.25
1	Carrying Case	Metal		17-3/4	18-1/4	16-1/2	28.00
2	RF Coaxial Cord CG-92/U		1700-015655900 1F430-92.72	72 long			
1	Video Cord CG-426/U			96 long			
2	Adapter Coaxial to Waveguide						
1	Adapter UG-201/U		8850-101950 2Z308-201				
1	Adapter UG-273/U		8850-102000 2Z308-273				
1	Operating Spare Including:						
10	Fuse 2 Amp.						
5	Fuse 1/16 Amp.						
2	Indicator Lamp						
1	External Directional Coupler, 25 decibels						

SIGNAL GENERATOR TS-602(XA)/U

FUNCTIONAL DESCRIPTION:

A self-contained set used for aligning ultra-high-frequency receivers and for measurement work where an accurate, adjustable and known radio frequency signal is required, unmodulated or pulsed. For pulsed operation external synchronization may be used. The radio frequency pulse output is variable in length and power and may be delayed up to 110 microseconds after the output synchronized pulse. All controls and indicators are located on the front panel of the signal generator. Frequency output, in KMS, power output in dbm, pulse repetition rate in pulses per second, pulse length in microseconds and pulse delay in microseconds are all directly indicated on calibrated dials.

RELATIONSHIP TO OTHER EQUIPMENT:

TS-621/U and TS-622/U supersedes TS-602(XA)/U as field type Signal Generators.

(Continued)

	AIR FORCE	NAVY	ARMY
TYPE CLASS.			
STOCK NOS.		SNSNF-16-G-63945-5481	
PROCUREM'T INFO.:			
PROCUREM'T COG.: USAF		DESIGN COG.: USAF, ARL	
F.I.I.N.:		FUNCTIONAL CLASS. NO.: 10.1.3	
	- Electronics Test Equipment -		TS-602(XA)/U

This project was supported by the USAF on Contract AF 33(600)28276 and monitored by WADC, ARDC - Carl L. Frederick, Bethesda, Md. - Multilithed in U. S. A.

SIGNAL GENERATOR TS-602(XA)/U

ELECTROMECHANICAL DESCRIPTION:

Circuit Information: The complete frequency range is covered by three reflex Klystron oscillators with overlapping frequency ranges. An external trigger pulse of either polarity may be applied to the multivibrator circuit or the multivibrator may be operated free running with adjustable frequency of oscillation controllable from the front panel.

Power Supply: 115 volts ±10%,AC, single phase, 60 cycles per second, 7.5 amperes approximately.

Type of Transmission: Pulsed, Continuous Wave.

Frequency Range: 4200 to 10,300 megacycles per second.

Modulation Data: Pulse Repetition Rate: 50 to 5000 cycles per second.
Pulse Length: 0.5 to 30 microseconds.
Pulse Delay: 1 to 100 microseconds.

Accuracy: Frequency Meter: ±1% of dial reading.
Pulse Repetition Rate: ±10% of dial reading.
Pulse Length: ±10% of dial reading.
Power Output: ±2 dbm.

Stability: 5 megacycles maximum drift over temperature range -10° C. to +40° C.

Power Output: -10 to -87 dbm calibrated, greater than 1 milliwatt uncalibrated.

MANUFACTURERS' OR CONTRACTORS' DATA:

Polytechnic Research and Development, 66 Court Street, Brooklyn 2, New York; Contract No. AF 33(038)8055, W33-038-ac-14641.

TUBE COMPLEMENT:

1 JAN-2C53, 1 JAN-2K39, 1 JAN-2K43, 1 JAN-2K44, 1 JAN-2X2A, 2 JAN-5R4GY, 2 JAN-6AG5, 3 JAN-6AG7, 2 JAN-6AH6, 2 JAN-6AL5, 1 JAN-6AQ5, 3 JAN-6AS7G, 4 JAN-6J6, 2 JAN-6SF5, 3 JAN-807, 2 JAN-1616, 1 RK-72, 1 JAN-OB2, 3 JAN-OC3/VR105, 6 JAN-OD3/VR150.

REFERENCE DATA AND LITERATURE:

Polytechnic Research and Development (Handbook of Maintenance Instructions for TS-602(XA)/U).

SHIPPING DATA:

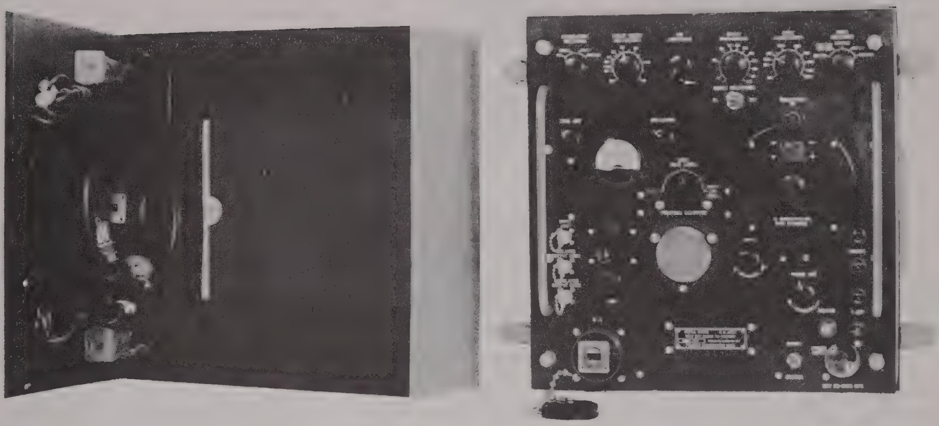
No. of Boxes	Contents & Identification	Volume (Cu. Ft.)	Over-all Dimensions (inches)			Weight Packed (Lbs.)
			H	W	D	

SIGNAL GENERATOR TS-602(XA)/U

EQUIPMENT SUPPLIED:

Quant. Per Eq'pt	Name and Nomenclature	Case Mat'l	Stock Numbers (USAF) (Navy) (Army)	Over-all Dimensions (inches)			Weight (Lbs.)
				H	W	D	
1	Signal Generator TS-602(XA)/U	Metal	F16-G-63945-5481	53	24	19	350

RADAR TEST SET TS-743/UPM



FUNCTIONAL DESCRIPTION:

A portable general purpose equipment used to measure the average power output of radar transmitters, the frequency of radar transmitters and receivers, and the sensitivity of radar receivers. It is also used to check the alignment of radio frequency circuits in radar systems. The modulation circuits can be internally or externally triggered. Internal trigger pulse and FM rates are continuously variable. Output Pulse Width is also continuously variable. The modulation signal delay is continuously variable with respect to the internal or external triggers, or there may be an undelayed signal followed by a delayed one. This feature is useful in checking radar range calibration.

RELATIONSHIP TO OTHER EQUIPMENT:

Similar to Polarad SG-1516.

	AIR FORCE	NAVY	ARMY
TYPE CLASS.			
STOCK NOS.			
PROCUREM'T INFO.:	Spec. SCL-2228 (SigC)		
PROCUREM'T COG.:	USA	DESIGN COG.:	USA, SCEL, ESL
F.I.I.N.:		FUNCTIONAL CLASS. NO.:	10.1.3
	- Electronics Test Equipment -		TS-743/UPM

This project was supported by the USAF on Contract AF 33(600)28276 and monitored by WADC, ARDC - Carl L. Frederick, Bethesda, Md. - Multilithed in U. S. A

RADAR TEST SET TS-743/UPM

ELECTROMECHANICAL DESCRIPTION:

Circuit Information: The circuitry consists of a reflex klystron oscillator, associated RF plumbing, attenuating devices, an absorption type wavemeter, pulse and FM modulating circuits, a thermistor bridge for measuring input or output, and power supplies.

Power Supply: 105 to 125 volts, AC, 50 to 1000 cycles per second, single-phase, 270 watts.

Frequency Range: 15,750 to 16,250 megacycles per second.

Type of Transmission: Continuous Wave, Frequency Modulated, Pulse Modulated.

Power Input Range: +6 to +30 dbm in 1-decibel steps; 1 kilowatt peak input, with a duty period of 0.1% or less.

Power Output Range: -6 to -91 dbm in 1 decibel steps.

Pulse Modulation Rate: 100 to 10,000 pulses per second.

Pulse Width: Continuously variable from 0.2 to 2 microseconds.

FM Sweep: Up to ±12.5 megacycles per second from center frequency.

FM Sweep Rate: 100 to 10,000 sweeps per second.

Types of Triggering: Internally, or by external RF pulses, positive or negative video pulses, or sine waves.

Delay Between Trigger Pulse and Modulation Pulse or Beginning of FM Sweep: 1 to 1000 microseconds, or up to 75% of interval between trigger pulses, whichever is less.

Delay Between Trigger Pulses and Delayed Output Pulse: 1 to 1000 microseconds, or up to 75% of interval between trigger pulses, whichever is less.

Output Pulse Amplitude: 10 to 50 volts, peak to peak.

Output Pulse Polarity: Positive.

Accuracy: ±10 megacycles per second, absolute (frequency measurement).
±5.0 megacycles per second, relative, over a 100 megacycles per second range (frequency measurement).
±1.5 decibels (power measurement).

Temperature Range: -40° C. (-40° F.) to +55° C. (+131° F.) fully operative.
-53° C. (-65° F.) to +65° C. (+149° F.) operative.

Altitude Range: Up to 10,000 feet, operative. Up to 50,000 feet, transportable.

Humidity Range: Up to 100% relative humidity, operative.

MANUFACTURERS' OR CONTRACTORS' DATA:

Polarad Electronics Corporation, 100 Metropolitan Avenue, Brooklyn 11, New York; USA Contract No. DA-36-039-sc-102. Order No. 13899-PH-50-5 (1306-A).

TUBE COMPLEMENT:

6 JAN-6AU6, 1 JAN-5R4WGY, 1 JAN-5Y3WGT, 1 JAN-5651, 7 JAN-12AT7, 2 JAN-6080, 2 JAN-OB2, 4 JAN-6CL6, 1 RETMA-QK297, 1 JAN-6X4, 2 JAN-6AR6WA, 1 JAN-6AH6.

REFERENCE DATA AND LITERATURE:

Manufacturer's Instruction Book.

RADAR TEST SET TS-743/UPM

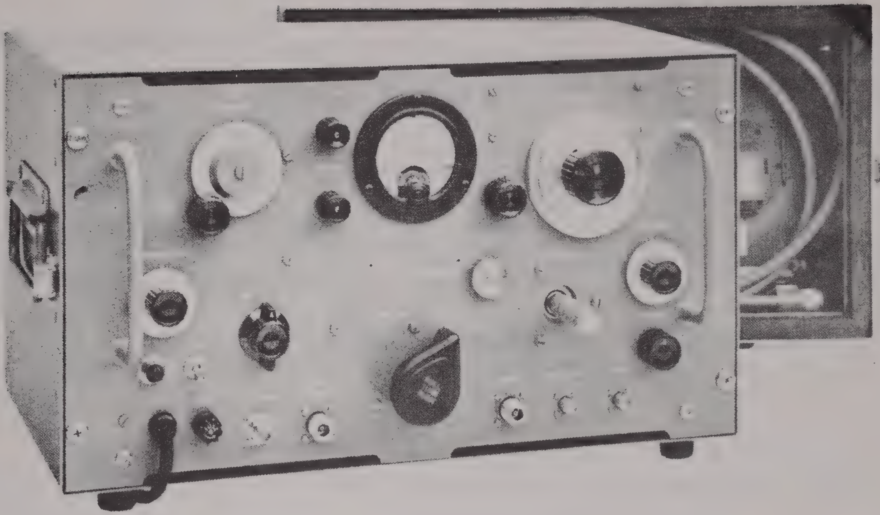
SHIPPING DATA:

No. of Boxes	Contents & Identification	Volume (Cu. Ft.)	Overall Dimensions (inches)			Weight Packed (Lbs.)
			H	W	D	
1	Radar Test Set TS-743/UPM	4.4	18-27/32	19-5/32	21-3/16	117

EQUIPMENT SUPPLIED:

Quant. Per Eq'pt	Name and Nomenclature	Case Mat'l	Stock Numbers (USAF) (Navy) (Army)	Overall Dimensions (inches)			Weight (Lbs.)
				H	W	D	
1	Radar Test Set TS-743/UPM	Aluminum		16-27/32	17-5/32	18-3/16	85
1	Combination Case						
1	Power Cable CX-337/U			74 long			
2	Video Cable RG-58/U terminating at each end in Connector UG-88/U			74 long			
1	Waveguide Assembly CG-539/U			24 long			
1	Waveguide Horn AT-531/UPM			3-1/4 long			

SIGNAL GENERATOR
MODEL DY-623B
(DYMEC, Incorporated)



FUNCTIONAL DESCRIPTION:

A portable, general purpose combination signal generator, frequency meter and power meter used in testing microwave transmitters and receivers operating within the SHF band. The equipment is used to measure receiver sensitivity and selectivity, and transmitter frequency and power level. The frequency dial is calibrated in megacycles per second and is complemented by an internal frequency meter for precise frequency setting. Frequency measurements are provided by a resonant indication on the power meter. The power meter is calibrated in decibels referred to one milliwatt.

RELATIONSHIP TO OTHER EQUIPMENT:

ELECTROMECHANICAL DESCRIPTION:

Circuit Information: The equipment consists essentially of a modulator, a klystron oscillator, an attenuator and a frequency meter and power meter. The overall frequency range of the equipment is covered in 3 bands; each of which is

(Continued)

	AIR FORCE	NAVY	ARMY
TYPE CLASS.	Standard		
STOCK NOS.			
PROCUREM'T INFO.:			
PROCUREM'T COG.: USAF		DESIGN COG.: Commercial	
F.I.I.N.: 6625-553-0337		FUNCTIONAL CLASS. NO.: 10.1.3	
	- Electronics Test Equipment -	DYMEC DY-623B	

SIGNAL GENERATOR
MODEL DY-623B
(DYMEC, Incorporated)

ELECTROMECHANICAL DESCRIPTION: (Continued)

approximately 600 megacycles per second wide. The frequency band is selected by installation of the proper klystron oscillator tube.

Power Supply: 115 or 230 volts, AC, 50 to 60 cycles per second, 150 watts.

Overall Frequency Range: 5925 to 7725 megacycles per second.

Klystron Frequency Bands: 5925 to 6575, 6575 to 7175 and 7175 to 7725 megacycles per second.

Frequency Meter Range: 5820 to 7780 megacycles per second.

Frequency Meter Accuracy: ±0.03%, ±0.016% with temperature correction.

Output Power: 0 to -70 decibels referred to 1 milliwatt.

Internal Modulation: 100 cycles per second frequency modulated.

External Modulation: Frequency modulated, pulse or square wave, 30 to 100,000 cycles per second.

Power Meter Range: -6 to +30 decibels referred to 1 milliwatt.

Power Meter Accuracy: ±1 decibel.

Temperature Range: -40°C to +55°C.

MANUFACTURERS' OR CONTRACTORS' DATA:

DYMEC, Incorporated, 295 Page Mill Road, Palo Alto, California; Approximate Cost per Unit, $1900.00.

TUBE COMPLEMENT:

2 JAN-6SN7, 1 JAN-OA2, 2 JAN-6AU5, 1 JAN-5R4GYA, 2 JAN-6CB6, 2 JAN-OB2, 2 JAN-6X4, 1 Klystron type VA-113, VA-114, or VA-115, 1 N21B.

REFERENCE DATA AND LITERATURE:

Manufacturer's Catalog.

SHIPPING DATA:

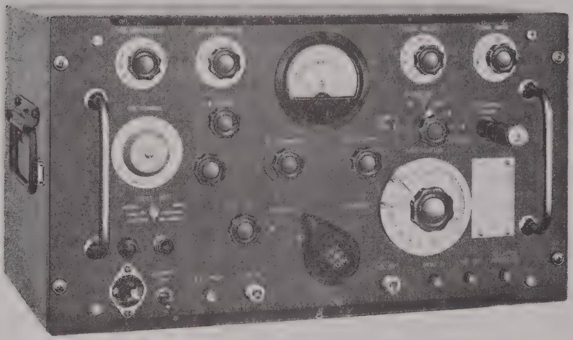
No. of Boxes	Contents & Identification	Volume (Cu. Ft.)	Overall Dimensions (inches)			Weight Packed (Lbs.)
			H	W	D	
1	Signal Generator and accessories					75

SIGNAL GENERATOR
MODEL DY-623B
(DYMEC, Incorporated)

EQUIPMENT SUPPLIED:

Quant. Per Eq'pt	Name and Nomenclature	Case Mat'l	Stock Numbers (USAF) (Navy) (Army)	Overall Dimensions (inches)			Weight (Lbs.)
				H	W	D	
1	Signal Generator DYMEC DY-623B	metal		11-1/2	20-3/8	12-1/2	56
2	RF Cable Assemblies						
1	Waveguide to Coaxial Adapter						
1	Spare Crystal						
1	Spare Thermistor						

SIGNAL GENERATOR
MODEL 624A
(Hewlett-Packard Company)



FUNCTIONAL DESCRIPTION:

A portable, general purpose, combination test set used in testing radar transmitters and receivers in the SHF range consisting of a signal generator, frequency meter and power meter. It will measure receiver sensitivity, receiver selectivity, receiver and transmitter tuning, and transmitter power level. The frequency dial is approximately calibrated in megacycles per second; the internal frequency meter is used for precise frequency settings. Frequency measurements are made by a resonant indication on the power meter. The power meter is calibrated in milliwatts and the attenuator dial is dbm.

RELATIONSHIP TO OTHER EQUIPMENT:

Used as an interim equipment for TS-147/UP and TS-147A/UP.

ELECTROMECHANICAL DESCRIPTION:

Circuit Information: Consists of a pulser, a tunable reflex Klystron, a filter to reduce the harmonic content of the power line voltage used for frequency modulation, a calibrated attenuator, a frequency meter and a power meter. The

(Continued)

	AIR FORCE	NAVY	ARMY
TYPE CLASS.			
STOCK NOS.			
PROCUREM'T INFO.:			
PROCUREM'T COG.:	DESIGN COG.: Commercial		
F.I.I.N.:	FUNCTIONAL CLASS. NO.: 10.1.3		
	- Electronics Test Equipment -	Hewlett-Packard 624A	

This project was supported by the USAF on Contract AF 33(600)28276 and monitored by WADC, ARDC - Carl L. Frederick, Bethesda, Md. - Multilithed in U. S. A.

SIGNAL GENERATOR
MODEL 624A
(Hewlett-Packard Company)

ELECTROMECHANICAL DESCRIPTION: (Continued)
frequency meter is a reaction type giving a minimum dip in power of at least 2 decibels at its resonant frequency. The power meter is a two-thermistor DC bridge in which the thermistors are used to compensate for temperature and sensitivity drift. The power absorbing element itself is also a thermistor, which permits measurement of average power and in both continuous wave and pulsed systems.

Power Supply: 115 to 230 volts ±10%, 50 to 60 cycles per second, 200 watts.

Frequency Range: 8500 to 10,000 megacycles per second.

Output Range: 0 dbm (1 milliwatt) to -100 dbm into a 50 ohm load. Type N coaxial jack.

Output Accuracy: Within 2 decibels from -10 to -100 dbm into matched load.

Type of Modulation: Pulse or Frequency Modulated.

Frequency Modulation: Internal frequency modulated at power line frequency. ±7.5 megacycles deviation obtainable. Can also be frequency modulated by external voltages from 35 to 3500 cycles per second.

Pulse Modulation: Pulse length variable from approximately 0.25 to 10 microseconds. Pulse rate variable from 35 to 3500 pulses per second.

External Synchronization: Internal pulses can operate free-running or synchronized from external pulses of 5 volts peak, positive or negative, or sine waves of 5 volts rms. Type BNC panel jack provided for external synchronized pulse.

Trigger Pulses: Two provided: one coincident with start of output radio frequency pulse, second is from 3 to 250 microseconds ahead of output radio frequency pulse as determined by panel control. Both pulses are positive and provided at BNC panel jacks.

Power Meter: 2 milliwatts full scale. Accurate within 1 decibel. Type N input jack provided.

Frequency Meter: Covers complete range of set. Accurate within 0.03% at 25° C. ambient. Temperature correction data supplied.

MANUFACTURERS' OR CONTRACTORS' DATA:

Hewlett-Packard Company, 395 Page Mill Road, Palo Alto, California; Approximate Cost per Unit, $2250.00, September 1952.

TUBE COMPLEMENT:

1 RETMA-12AX7, 5 RETMA-12AU7, 1 RETMA-2D21, 1 RETMA-6AG7, 1 RETMA-5U4G, 1 RETMA-6X4, 1 RETMA-6AS7G, 1 RETMA-6CBC, 2 RETMA-OA2, 1 RETMA-OB2, 1 Type-V-50 (Klystron).

REFERENCE DATA AND LITERATURE:

Hewlett-Packard Journal, Volume 3, No. 2, October 1951.

SIGNAL GENERATOR
MODEL 624A
(Hewlett-Packard Company)

SHIPPING DATA:

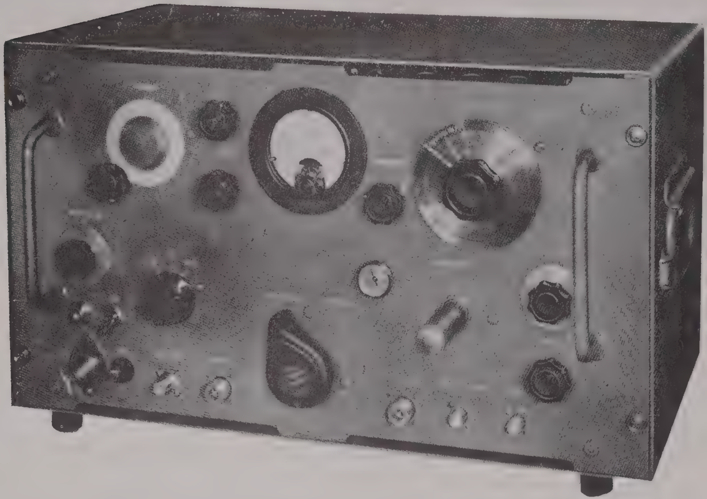
No. of Boxes	Contents & Identification	Volume (Cu. Ft.)	Overall Dimensions (inches)			Weight Packed (Lbs.)
			H	W	D	
1	Signal Generator Model 624A					96

EQUIPMENT SUPPLIED:

Quant. Per Eq'pt	Name and Nomenclature	Case Mat'l	Stock Numbers (USAF) (Navy) (Army)	Overall Dimensions (inches)			Weight (Lbs.)
				H	W	D	
1	Signal Generator Model 624A			11-1/2	20	14	56
1	Waveguide to Type N Adapter having VSWR less than 1.25			1	1/2		
1	Output Cable			72 long			
1	Detachable Power Cable						

357

TEST SET, MICROWAVE, RF
Nos. 463-2338-1, 463-2338-2 and 463-2338-3
(Philco Corporation)



FUNCTIONAL DESCRIPTION:

This equipment is for the purpose of measuring the overall performance of a microwave system. The following test functions can be accomplished: (1) Measurement of transmitter output power; (2) Measurement of transmitter output frequency; (3) Measurement of received-signal strength; (4) AGC/received-signal calibration; (5) Waveguide phaser and variable attenuator adjustment.

RELATIONSHIP TO OTHER EQUIPMENT:

Three model Nos. 463-2338-1, 463-2338-2, and 463-2338-3 are similar except for different oscillator tubes which permit operation in the Government, Industrial or Common Carrier band in that order.

ELECTROMECHANICAL DESCRIPTION:

Circuit Information: The circuit incorporates a klystron oscillator, a variable attenu-

(Continued)

	AIR FORCE	NAVY	ARMY
TYPE CLASS.			
STOCK NOS.			

PROCUREM'T INFO.:

PROCUREM'T COG.: DESIGN COG.: Commercial

F.I.I.N.: FUNCTIONAL CLASS. NO.: 10.1.3

- Electronics Test Equipment - Philco 463-2338-1
463-2338-2
463-2338-3

This project was supported by the USAF on Contract AF 33(600)28276 and monitored by WADC, ARDC - Carl L. Frederick, Bethesda, Md. - Multilithed in U.S.A

TEST SET, MICROWAVE, RF
Nos. 463-2338-1, 463-2338-2 and 463-2338-3
(Philco Corporation)

ELECTROMECHANICAL DESCRIPTION: (Continued)
ator, a modulator, a power meter, a frequency meter, a crystal detector, and a regulated power supply. Modulation voltage applied to the reflector modulates the oscillator. A 1000-cycle modulator provides internal FM modulation and also supplies a phaseable sine wave voltage for external use. The internal 1000-cycle FM modulation may be adjusted from zero to ±6 megacycles per second deviation.

Power Supply: 117 volts, AC, 60 cycles per second, single-phase, 150 watts.

Frequency Range: Frequency and power meter: 5825 to 7725 megacycles per second.
Signal generator: 5925 to 7725 megacycles per second.

Frequency Meter Accuracy: ±0.016% at an ambient temperature of 25°C.

Power Meter Accuracy: ±1 decibel.

Power Meter Sensitivity: 2 milliwatt full scale.

Power Output Ratings: Range: 0 dbm to -65 dbm into 50-ohm load.
Accuracy: ±2 decibels into matched load.

Modulation: FM (Internal): ±6 megacycles per second maximum deviation at 1000 cycles per second.
FM (External): ±15 megacycles per second maximum deviation at 30 to 100,000 cycles per second.
Pulse and Square Wave: Approximately 40 volts peak-to-peak required. Repetition rate 30 to 100,000 pulses per second.

MANUFACTURERS' OR CONTRACTORS' DATA:
Philco Corporation, 4700 Wissahickon Avenue, Philadelphia 44, Pennsylvania.

TUBE COMPLEMENT:
2 JAN-6SN7, 1 JAN-OA2, 2 JAN-6AU5, 1 JAN-5R4, 2 JAN-6CB6, 1 JAN-OB2, 2 JAN-6X4, 1 JAN-6AU6, 1 JAN-K-26-B.

REFERENCE DATA AND LITERATURE:
Philco Corporation Bulletin (Microwave RF Test Set).

SHIPPING DATA:

No. of Boxes	Contents & Identification	Volume (Cu. Ft.)	Overall Dimensions (inches)			Weight Packed (Lbs.)
			H	W	D	

Philco 463-2338-1
463-2338-2
463-2338-2

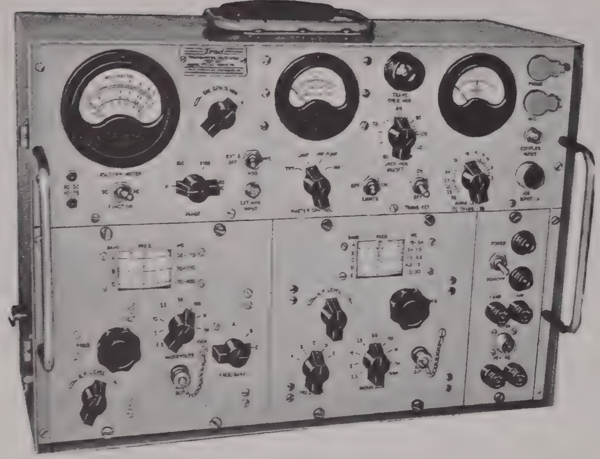
- Electronics Test Equipment -

TEST SET, MICROWAVE, RF
Nos. 463-2338-1, 463-2338-2 and 463-2338-3
(Philco Corporation)

EQUIPMENT SUPPLIED:

Quant. Per Eq'pt	Name and Nomenclature	Case Mat'l	Stock Numbers (USAF) (Navy) (Army)	Overall Dimensions (inches)			Weight (Lbs.)
				H	W	D	
1	Test Set, Microwave, RF (Philco 463-2338-1, 463-2338-2, and 463-2338-3)			11-1/2	21	14	59

TEST SET, RADIO AN/TRM-1



FUNCTIONAL DESCRIPTION:

A portable, general purpose combination signal generator and power meter designed to provide performance measurements on radio receivers and transmitters. Meters calibrated in percent of modulation, milliwatts and carrier level permit measurement of the percent of modulation at antenna or transmission line terminals, detect the presence of carrier level shift, and determine relative power output. A neon panel lamp permits the detection of over-modulated peaks. A VHF coupler permits direct measurement of transmitter power when properly terminated. An RF coupler permits the monitoring of power at the antenna of a transmitter using open wire systems with negligible loading effect on the transmitter.

RELATIONSHIP TO OTHER EQUIPMENT:

Similar to Transmitter Receiver Test Set Trad Electronics RT-500.

	AIR FORCE	NAVY	ARMY
TYPE CLASS.		Standard	
STOCK NOS.			
PROCUREM'T INFO.:			
PROCUREM'T COG.: Navy		DESIGN COG.: Navy, BuAer	
F.I.I.N.: 6625-648-8348		FUNCTIONAL CLASS. NO.: 10.1.4	
- Electronics Test Equipment -			AN/TRM-1

TEST SET, RADIO AN/TRM-1

ELECTROMECHANICAL DESCRIPTION:

Circuit Information: The equipment consists of two radio frequency signal generators and a monitor unit. Each of the two radio frequency signal generators is a separate plug-in unit with its circuits enclosed in an aluminum housing. The monitor unit includes the meters used for test indications. The equipment also contains an integral calibrated signal source.

Power Supply: 115 volts, AC, 60 cycles per second.

Transmitter Performance Tester:

- Frequency Range: 190 kilocycles per second to 100 megacycles per second, using radio frequency coupler; 50 to 400 megacycles per second using ultra high frequency coupler.
- Power Range: 3 to 100 watts.
- Percent Modulation: 0 to 100% ±10% from 200 to 6000 cycles per second.
- Over Modulation Detector: 60 to 120% from 200 to 6000 cycles per second.
- Calibrated Signal Source: 1000 cycles per second, 3 volts, 0 to 36 decibels ±2 decibels.

Signal Generator (SG-32/TRM-1):

- Frequency Range: 190 kilocycles per second to 30 megacycles per second in 5 bands.
- Voltage Output: 2.5 to 100,000 microvolts ±10% from 190 kilocycles per second to 12 megacycles per second, ±20% from 12 to 30 megacycles per second; variable in 8 discrete steps.
- Output Impedance: 50 ohms.
- Internal Amplitude Modulation: 1000 cycles per second, 0 to 60%.
- External Amplitude Modulation: 200 to 6000 cycles per second.

Signal Generator (SG-33/TRM-1):

- Frequency Range: 30 to 400 megacycles per second in 3 bands.
- Output Voltage: 2.5 to 100,000 microvolts ±10% from 30 to 200 megacycles per second, ±20% from 200 to 400 megacycles per second in 8 discrete steps.
- Internal Amplitude Modulation: 1000 cycles per second, 0 to 60%.
- External Modulation: 200 to 6000 cycles per second.

Volt-Milliwatt Meter:

- Milliwatt Range: 0 to 10, 100, 1000 ±3%.
- Frequency Range: 200 to 6000 cycles per second.
- Input Impedance: 300 ohms.
- Alternating Voltage Range: 0 to 3, 30, 300 volts ±5%.
- Frequency Range: 50 to 6000 cycles per second.
- Alternating Voltage Sensitivity: 5000 ohms per volt.
- DC Voltage Range: 0 to 3, 30, 300, 600 volts ±5%.

TEST SET, RADIO AN/TRM-1

ELECTROMECHANICAL DESCRIPTION: (Continued)

Direct Voltage Sensitivity: 20,000 ohms per volt.

MANUFACTURERS' OR CONTRACTORS' DATA:

Trad Electronics Corporation, 1001 First Avenue, Asbury Park, New Jersey; Contract No. NOa(s) 51-819; Approximate Cost per Unit, $1,200.00.

TUBE COMPLEMENT:

REFERENCE DATA AND LITERATURE:

Manufacturer's Catalog.

SHIPPING DATA:

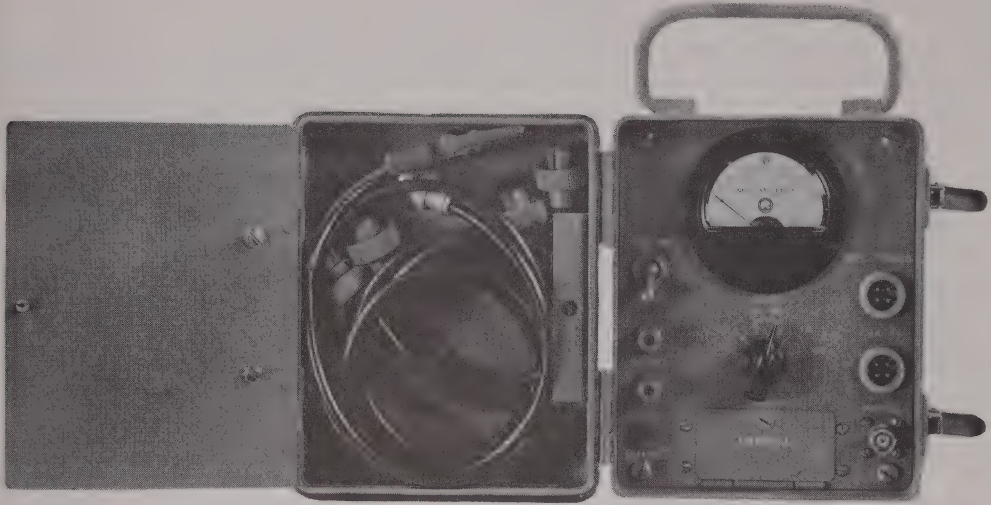
No. of Boxes	Contents & Identification	Volume (Cu. Ft.)	Overall Dimensions (inches)			Weight Packed (Lbs.)
			H	W	D	
	Test Set, Radio AN/TRM-1					

TEST SET, RADIO AN/TRM-1

EQUIPMENT SUPPLIED:

Quant. Per Eq'pt	Name and Nomenclature	Case Mat'l	Stock Numbers (USAF) (Navy) (Army)	Overall Dimensions (inches)			Weight (Lbs.)
				H	W	D	
1	Test Set, Radio AN/TRM-1	metal					
1	RF Coupler (190 kc to 100 mc)						
1	UHF Coupler (50 to 400 mc)						
1	Antenna Simulator						
1	Fixed 6 db Attenuator						
1	Fixed 12 db Attenuator						
1	50 ohm Adapter						
1	Set Cables (coaxial)						
1	Tee Adapter (Type N)						
1	Tee Adapter (Type UHF)						
1	Adapter (UHF plug to BNC socket)						
1	Adapter (N plug to BNC socket)						
1	Cable Assembly			980 long			
1	Cable Assembly Power			96 long			

RADIO TEST SET AN/URM-30



FUNCTIONAL DESCRIPTION:

A small, compact,and portable go-no-go analyzer capable of measuring audio output from a receiver and RF power output from a transmitter and generating a modulated RF signal.

RELATIONSHIP TO OTHER EQUIPMENT:

Used to test Radio Set AN/URC-4.

ELECTROMECHANICAL DESCRIPTION:

Circuit Information: Consists of 1.5 DC milliammeter and one crystal oscillator contained in a combination aluminum case.

Power Supply: 1.05 volts DC to 1.34 volts DC, and 75 volts DC to 147 volts DC.

Frequency Range: 120 to 130 megacycles and 240 to 260 megacycles.

Type of Transmission: Amplitude Modulated.

Voltage Output: At least 100 microvolts uncalibrated.

Output Impedance: 51.5 ohms.

(Continued)

	AIR FORCE	NAVY	ARMY
TYPE CLASS.	Standard		
STOCK NOS.	7CAC-801319-2543		3F3945-30
PROCUREM'T INFO.: USAF Spec. MIL-R-6372A (1952)			
PROCUREM'T COG.: USAF		DESIGN COG.: USAF, C&N	
F.I.I.N.:		FUNCTIONAL CLASS. NO.: 10.1.4	
- Electronics Test Equipment -			AN/URM-30

This project was supported by the USAF on Contract AF 33(600)28276 and monitored by WADC, ARDC - Carl L. Frederick, Bethesda, Md. - Multilithed in U.S.A.

RADIO TEST SET AN/URM-30

ELECTROMECHANICAL DESCRIPTION: (Continued)
Modulation Data: 900 to 1500 cycles per second, 20% Amplitude Modulated.
Accuracy: ±0.008% of desired operating frequency (crystal controlled).
Temperature Range: -40° C. to $+55^{\circ}$ C.

MANUFACTURERS' OR CONTRACTORS' DATA:
Hoffman Radio Corporation, Los Angeles, California; Contract AF 33(038)5603; Approximate Cost per Unit, $94.43.

TUBE COMPLEMENT:
1 JAN-385A, 1-CR24 (Crystal), 2 JAN-1N34 (Crystal).

REFERENCE DATA AND LITERATURE:
TO 16-35TS684-2 (Operation and Maintenance).
TO 16-35TS684-4 (Parts Catalog).
TO 16-30URM30-1 (Operation and Maintenance).
TO 16-30URM30-4 (Parts Catalog).
TO 16-30URM30-11 (Operation and Service Instructions).
TO 16-30URM30-12 (Service Instructions).
TO 16-30URM30-13 (Overhaul Instructions).
TO 16-30URM30-14 (Parts Breakdown).

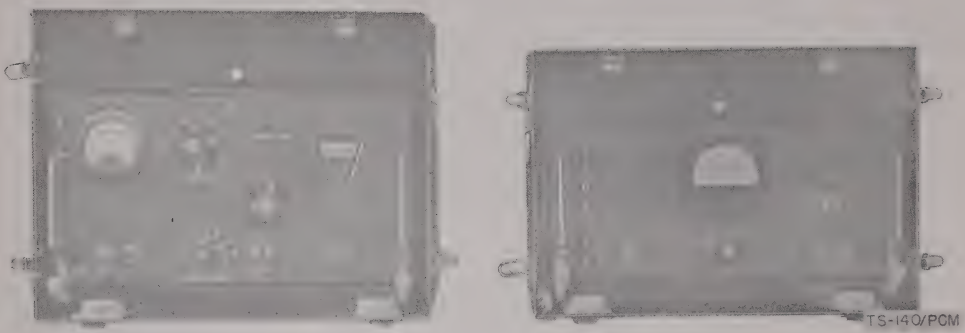
SHIPPING DATA:

No. of Boxes	Contents & Identification	Volume (Cu. Ft.)	Overall Dimensions (inches)			Weight Packed (Lbs.)
			H	W	D	
1	Radio Test Set, AN/URM-30 (Shelf Package)	0.213	7	5	10-1/2	5.5

EQUIPMENT SUPPLIED:

Quant. Per Eq'pt	Name and Nomenclature	Case Mat'l	Stock Numbers (USAF) (Navy) (Army)	Overall Dimensions (inches)			Weight (Lbs.)
				H	W	D	
1	Analyzer TS-684/URM-30		7CAC-801319-2564 3F4325-692	5	3	6	2
1	Antenna AT-293/URM-30						
2	Cable CX-1093/U		1600-324763581	30 long			
1	RF Cable Assembly CG-606/U			30 long			
1	Case					Total:	4.5

TEST SET TS-140/PCM



FUNCTIONAL DESCRIPTION:

A portable, general purpose transmission measuring set used to facilitate the proper matching of circuits in the establishment of a wire or wire-radio communication circuit and for testing carrier and voice-frequency repeater and terminal equipment in depots. It consists of a signal generator and a decibel meter, each in a separate case and separately nomenclatured. All controls, connections, and indicators are on the individual front panels. Each unit is shock-mounted within its transit case. Each instrument contains a pair of carrying handles attached to its front panel.

RELATIONSHIP TO OTHER EQUIPMENT:

ELECTROMECHANICAL DESCRIPTION:

Power Supply: 115/230 volts ±10%, AC, 50 to 70 cycles per second, single phase, 150 watts.

(Continued)

	AIR FORCE	NAVY	ARMY
TYPE CLASS.			
STOCK NOS.	1600-329000040		3F4325-140
PROCUREM'T INFO.: Army Spec. (SigC) 71-3354			
PROCUREM'T COG.: Army		DESIGN COG.: Army, CSL	
F.I.I.N.:		FUNCTIONAL CLASS. NO.: 10.1.4	
- Electronics Test Equipment -		TS-140/PCM	

This project was supported by the USAF on Contract AF 33(600)28276 and monitored by WADC, ARDC - Carl L. Frederick, Bethesda, Md. - Multilithed in U. S. A.

TEST SET TS-140/PCM

ELECTROMECHANICAL DESCRIPTION: (Continued)

Frequency Range: 200 to 35,000 cycles per second.
Type of Transmission: Continuous Wave.
Signal Generator Output Range: -50 to +20 dbm.
Decibel Meter Measuring Range: -30 to +10 dbm.
Signal Generator Output Impedance: 600 ohms balanced to ground.
Decibel Meter Input Impedance: 600 ohms and 8000 ohms (bridging) balanced to ground.
Signal Generator Frequency Characteristics: ±0.5 dbm.
Decibel Meter Accuracy of Measurement: ±0.5 dbm.
Signal Generator Accuracy of Calibration:
  200 to 1000 cycles per second: ±10 cycles per second.
  1000 to 2000 cycles per second: ±20 cycles per second.
  2000 to 35,000 cycles per second: ±50 cycles per second.

MANUFACTURERS' OR CONTRACTORS' DATA:

Connecticut Telephone and Electric Division, Great American Industries, Inc., Meriden, Connecticut; Army Order No. 24635-PHILA-49-7; Contel Part/dwg. No. 5489.

TUBE COMPLEMENT:

Signal Generator SG-15/PCM: 3 JAN-6J5, 1 JAN-6L6GAY, 1 JAN-6SA7Y, 2 JAN-6SJ7, 1 JAN-6SL7GT, 1 JAN-6SQ7, 2 JAN-6V6Y, 1 JAN-OC3/VR-105, 1 JAN-5Y3GT.

Decibel Meter ME-22/PCM: 1 JAN-6H6, 1 JAN-6L6GAY, 3 JAN-6SJ7, 1 JAN-6SQ7, 1 JAN-OC3/VR-105, 1 JAN-5Y3GT.

REFERENCE DATA AND LITERATURE:

TM 11-2096 (Instruction Book).

SHIPPING DATA:

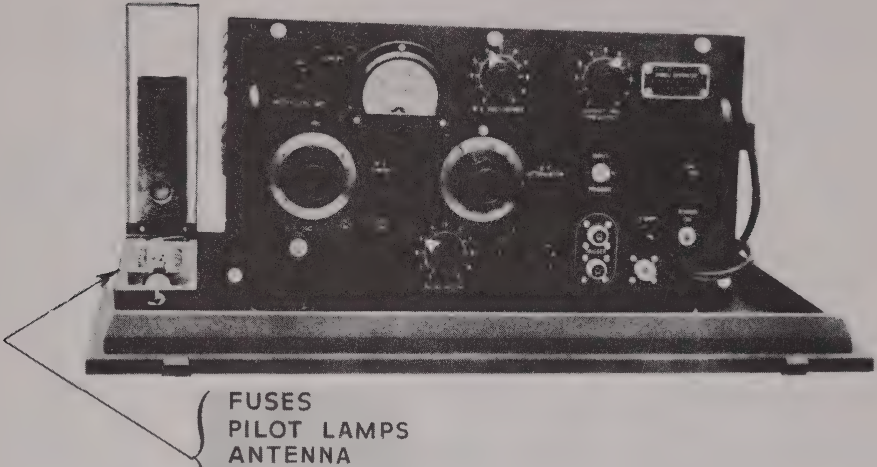
No. of Boxes	Contents & Identification	Volume (Cu. Ft.)	Over-all Dimensions (inches)			Weight Packed (Lbs.)
			H	W	D	
1	Signal Generator SG-15/PCM (Export Packed)	13.72	23-3/4	43	24-1/4	160
1	Decibel Meter ME-22/PCM (Export Packed)	6.3	20-3/4	43	20-3/4	122

TEST SET TS-140/PCM

EQUIPMENT SUPPLIED:

Quant. Per Eq'pt	Name and Nomenclature	Case Mat'l	Stock Numbers (USAF) (Navy) (Army)	Over-all Dimensions (inches)			Weight (Lbs.)
				H	W	D	
1	Test Set TS-140/PCM Including:	Aluminum	1600-329000040 3F4325-140				
1	Signal Generator SG-15/PCM	Aluminum	1800-203132310 3F4325-427	8-3/4	19	13-1/4	52
1	Decibel Meter ME-22/PCM	Aluminum	3F3307.11-1	7	19	10-7/8	25
1	Case CY-711/PCM			10-3/4	21-1/4	14-1/4	31
1	Case CY-712/PCM			10-3/4	21-1/4	16-1/4	38
2	Cord		3E2P13D				

SIGNAL GENERATOR TS-155/UP
(GENERATOR, SIGNAL, TS-155/UP)



FUSES
PILOT LAMPS
ANTENNA
ADAPTER
THERMISTORS

FUNCTIONAL DESCRIPTION:

A portable, general purpose signal generator designed for field testing. Checks overall system performance, receiver sensitivity and power output of transmitters. Supplies external trigger pulses to radar systems.

RELATIONSHIP TO OTHER EQUIPMENT:

Interchangeable with Signal Generator TS-155A/UP and TS-155B/UP except as to parts.

ELECTROMECHANICAL DESCRIPTION:

Circuit Information: The structure of the signal generator is conventional except for the cavity and its associated parts. The principal parts of the complete assembly consist of the cavity proper, the thermistor monitoring system, and the attenuator.

Power Supply: 115 volts ±10%, AC, single phase, 50 to 800 cycles per second, 90 watts. Provision is also made for 210 to 250 volts operation.

(Continued)

	AIR FORCE	NAVY	ARMY
TYPE CLASS.			
STOCK NOS.	7CAC-363977	F16-G-63942-6291	3F4325-155
PROCUREM'T INFO.: Army Spec. No. MIL-S-10728 and 371229			
PROCUREM'T COG.: Army		DESIGN COG.: Army, ESL	
F.I.I.N.:		FUNCTIONAL CLASS. NO.: 10.1.4	
- Electronics Test Equipment -			TS-155/UP

This project was supported by the USAF on Contract AF 33(600)28276 and monitored by WADC, ARDC - Carl L. Frederick, Bethesda, Md. - Multilithed in U. S. A.

SIGNAL GENERATOR TS-155/UP
(GENERATOR, SIGNAL, TS-155/UP)

ELECTROMECHANICAL DESCRIPTION: (Continued)

Frequency Range: 2700 to 2900 megacycles per second.

Type of Transmission: Pulse Modulated.

Power Output: Directly calibrated in decibels below 1 milliwatt over the range from -20 to -100 decibels.

Output Impedance: 50 ohms.

Internally Synchronized:

- Trigger Frequency: 120 to 2000 cycles per second.
- Pulse Width: 0.75 to 6.0 microseconds (continuously variable) at half amplitude and at a repetition rate of approximately 2000 cycles per second.
- Pulse Delay: 5 to 1800 microseconds (continuously variable) at a repetition rate of approximately 2000 cycles per second.
- Pulse Shape: Essentially rectangular.
  - Rise Time: 0. 25 microseconds from 10% to 90% voltage.
  - Fall Time: 0. 3 microseconds from 90% to 10% voltage.

Externally Synchronized:

- External Trigger Requirements:
- Trigger Frequency: 120 to 2000 cycles per second.
- Width: 0. 5 to 18. 0 microseconds measured at half voltage points.
- Polarity: Either positive or negative.
- Amplitude: 15 to 100 volts. Negative pulses work into an input of less than 47,000 ohms. Positive pulses work into an input of less than 47,000 ohms.
- Rise Time: Less than 0. 2 microseconds rise time to 20 volts.
- Pulse Width: 0.75 to 6.0 microseconds (continuously variable) at half amplitude and at a repetition rate of approximately 2000 cycles per second.
- Pulse Delay: 5 to 1800 microseconds (continuously variable) at a repetition rate of approximately 2000 cycles per second.
- Pulse Shape: Essentially rectangular.
  - Rise Time: 0. 25 microseconds from 10% to 90% voltage.
  - Fall Time: 0. 3 microseconds from 90% to 10% voltage.

MANUFACTURERS' OR CONTRACTORS' DATA:

Westinghouse Corporation, Pittsburgh, Pennsylvania; Contract No. 650-SCRL-42, dated 17 March 1945; Approximate Cost per Unit, $1620. 00

TUBE COMPLEMENT:

4 JAN-6SN7/GT, 1 JAN-6AG7, 1 JAN-OD3/VR-150, 1 JAN-OC3/VR-105, 1 JAN-5U4G, 1 JAN-446B, or 2C40.

REFERENCE DATA AND LITERATURE:

CO-16-35TS155-3 (Handbook of Maintenance Instructions).
TO 16-55-395 (Spare Parts List).
TO 16-35TS155-7 (TM 11-2657 and Change 1) (Signal Generator).

SIGNAL GENERATOR TS-155/UP
(GENERATOR, SIGNAL, TS-155/UP)

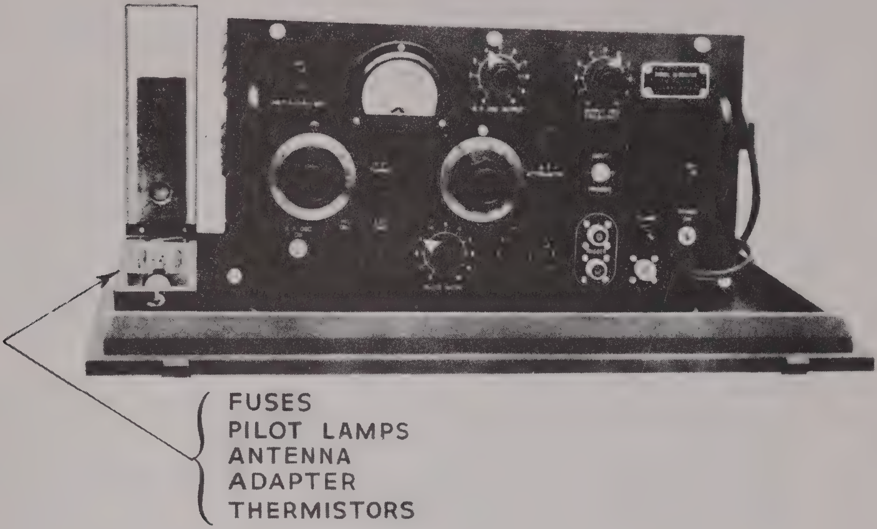
SHIPPING DATA:

No. of Boxes	Contents & Identification	Volume (Cu. Ft.)	Overall Dimensions (inches)			Weight Packed (Lbs.)
			H	W	D	
1	Signal Generator TS-155/UP (Export Packed)	3.33	26	17	13	96

EQUIPMENT SUPPLIED:

Quant. Per Eq'pt	Name and Nomenclature	Case Mat'l	Stock Numbers (USAF) (Navy) (Army)	Overall Dimensions (inches)			Weight (Lbs.)
				H	W	D	
1	Signal Generator TS-155/UP	Aluminum	7CAC-363977 F16-G-63942-6291 3F4325-155	17	10	10	50
1	Antenna Cable CG-70/MPM		7CAC-170265-43	180 long			1.5
1	Trigger Cable CG-71/MPM		7CAC-472692	72 long			0.7
1	Trigger Cable CX-145/MPM			360 long			1.5
1	Adapter UG-131/U		3300-286054505	5/8	5/8	1-1/2	0.1
1	Antenna AS-23/AP		7CHE-A4369	3-3/4	2-1/4	1-1/4	3.5
4	Allen Set Screw Wrench, Nos. 4, 6, 8, and 10 (in instrument)						
1	Transit Case	Wood		26-1/2	16-1/4	12-7/8	

SIGNAL GENERATOR TS-155A/UP
(GENERATOR, SIGNAL, TS-155A/UP)



FUSES
PILOT LAMPS
ANTENNA
ADAPTER
THERMISTORS

FUNCTIONAL DESCRIPTION:

A portable, general purpose signal generator designed for field testing. Checks overall system performance, receiver sensitivity and power output of transmitters. Supplies external trigger pulses to radar systems.

RELATIONSHIP TO OTHER EQUIPMENT:

Interchangeable with Signal Generator TS-155/UP and TS-155B/UP except as to parts.

ELECTROMECHANICAL DESCRIPTION:

Circuit Information: The structure of the signal generator is conventional except for the cavity and its associated parts. The principal parts of the complete assembly consist of the cavity proper, the thermistor monitoring system, and the attenuator.

Power Supply: 115 volts, ±10%, AC, single phase, 50 to 800 cycles per second, 90 watts. Provision is also made for 210 to 250 volts operation.

(Continued)

	AIR FORCE	NAVY	ARMY
TYPE CLASS.			
STOCK NOS.	1690-32900120		3F4325-155A
PROCUREM'T INFO.:	Army Spec. No. MIL-S-10728		
PROCUREM'T COG.:	Army	DESIGN COG.:	Army, ESL
F.I.I.N.:		FUNCTIONAL CLASS. NO.:	10.1.4
	- Electronics Test Equipment -		TS-155A/UP

This project was supported by the USAF on Contract AF 33(600)28276 and monitored by WADC, ARDC - Carl L. Frederick, Bethesda, Md. - Multilithed in U. S. A.

SIGNAL GENERATOR TS-155A/UP
(GENERATOR, SIGNAL, TS-155A/UP)

ELECTROMECHANICAL DESCRIPTION: (Continued)

Frequency Range: 2700 to 2900 megacycles per second.

Type of Transmission: Pulse Modulated.

Power Output: Directly calibrated in decibels below 1 milliwatt over the range from -20 to -100 decibels.

Output Impedance: 50 ohms.

Internally Synchronized:

- Trigger Frequency: 120 to 2000 cycles per second.
- Pulse Width: 0.75 to 6.0 microseconds (continuously variable) at half amplitude and at a repetition rate of approximately 2000 cycles per second.
- Pulse Delay: 5 to 1800 microseconds (continuously variable) at a repetition rate of approximately 2000 cycles per second.
- Pulse Shape: Essentially rectangular.
  - Rise Time: 0.25 microseconds from 10% to 90% voltage.
  - Fall Time: 0.3 microseconds from 90% to 10% voltage.

Externally Synchronized:

- External Trigger Requirements:
- Trigger Frequency: 120 to 2000 cycles per second.
- Width: 0.5 to 18.0 microseconds measured at half voltage points.
- Polarity: Either positive or negative.
- Amplitude: 15 to 100 volts. Negative pulses work into an input of less than 47,000 ohms. Positive pulses work into an input of less than 47,000 ohms.
- Rise Time: Less than 0.2 microseconds rise time to 20 volts.
- Pulse Width: 0.75 to 6.0 microseconds (continuously variable) at half amplitude and at a repetition rate of approximately 2000 cycles per second.
- Pulse Delay: 5 to 1800 microseconds (continuously variable) at a repetition rate of approximately 2000 cycles per second.
- Pulse Shape: Essentially rectangular.
  - Rise Time: 0.25 microseconds from 10% to 90% voltage.
  - Fall Time: 0.3 microseconds from 90% to 10% voltage.

MANUFACTURERS' OR CONTRACTORS' DATA:

Lavoie Laboratories, Morganville, New Jersey; Contract No. 5040-45-GR, dated 19 June 1945; Approximate Cost per Unit, $1202.00.

TUBE COMPLEMENT:

4 JAN-6SN7/GT, 1 JAN-6AG7, 1 JAN-OD3/VR-150, 1 JAN-OC3/VR-105, 1 JAN-5U4G, 1 JAN-446B, or 2C40.

REFERENCE DATA AND LITERATURE:

TO 16-35TS155-9	(TM 11-2657 and Change 1) (Signal Generator).
CO-16-35TS155-3	(Handbook of Maintenance Instructions).
TO 16-55-395	(Spare Parts List).

SIGNAL GENERATOR TS-155A/UP
(GENERATOR, SIGNAL, TS-155A/UP)

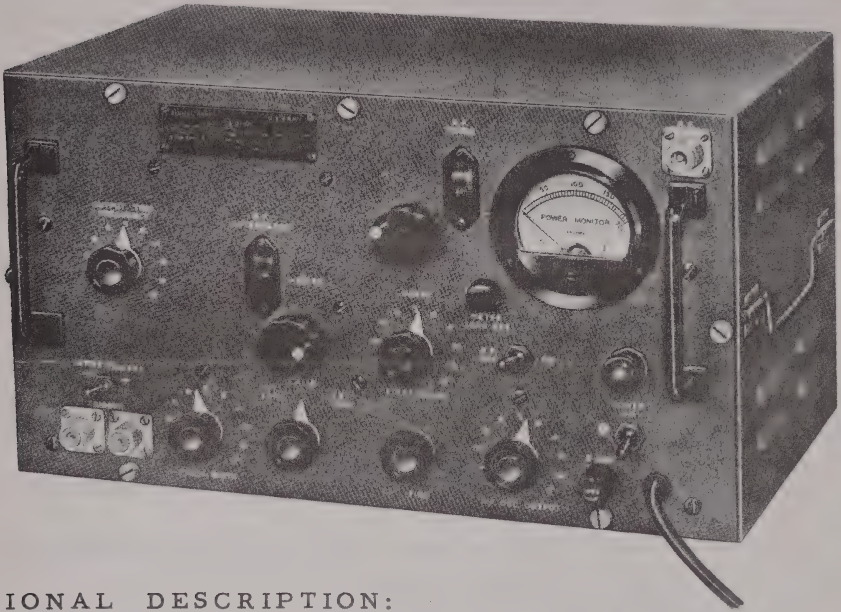
SHIPPING DATA:

No. of Boxes	Contents & Identification	Volume (Cu. Ft.)	Overall Dimensions (inches)			Weight Packed (Lbs.)
			H	W	D	
1	Signal Generator TS-155A/UP (Export Packed)	3.33	26	17	13	96

EQUIPMENT SUPPLIED:

Quant. Per Eq'pt	Name and Nomenclature	Case Mat'l	Stock Numbers (USAF) (Navy) (Army)	Overall Dimensions (inches)			Weight (Lbs.)
				H	W	D	
1	Signal Generator TS-155A/UP	Aluminum	1690-32900120 3F4325-155A	17	10	10	50
1	Antenna Cable CG-70/MPM		7CAC-170265-43	180 long			1.5
1	Trigger Cable CG-71/MPM		7CAC-472692	72 long			0.7
1	Trigger Cable CX-145/MPM			360 long			1.5
1	Adapter UG-131/U		3300-286054505	5/8	5/8	1-1/2	0.1
1	Antenna AS-23/AP		7CHE-A4369	3-3/4	2-1/4	1-1/4	3.5
4	Allen Set Screw Wrench, Nos. 4, 6, 8, and 10 (in instrument)						
1	Transit Case	Wood		26-1/4	16-1/4	12-7/8	

SIGNAL GENERATOR TS-155B/UP
(GENERATOR, SIGNAL, TS-155B/UP)



FUNCTIONAL DESCRIPTION:

A portable, general purpose signal generator designed for field testing. Checks overall system performance, receiver sensitivity and power output of transmitters. Supplies external trigger pulses to radar systems.

RELATIONSHIP TO OTHER EQUIPMENT:

Similar to TS-155/UP and TS-155A/UP, except that the TS-155B/UP also has an improved new type cavity.

ELECTROMECHANICAL DESCRIPTION:

Circuit Information: The structure of the signal generator is conventional except for the cavity and its associated parts. The principal parts of the complete assembly consist of the cavity proper, the thermistor monitoring system, and the attenuator.

Power Supply: 115 volts, ±10%, AC, single phase, 50 to 800 cycles per second, 100 watts.

(Continued)

	AIR FORCE	NAVY	ARMY
TYPE CLASS.			
STOCK NOS.	7CAC-363976		3F4325-155B
PROCUREM'T INFO.: Army Spec. No. MIL-S-10728			
PROCUREM'T COG.: Army		DESIGN COG.: Army, ESL	
F.I.I.N.:		FUNCTIONAL CLASS. NO.: 10.1.4	
	- Electronics Test Equipment -		TS-155B/UP

This project was supported by the USAF on Contract AF 33(600)28276 and monitored by WADC, ARDC - Carl L. Frederick, Bethesda, Md. - Multilithed in U. S. A.

SIGNAL GENERATOR TS-155B/UP
(GENERATOR, SIGNAL, TS-155B/UP)

ELECTROMECHANICAL DESCRIPTION: (Continued)

Frequency Range: 2700 to 2900 megacycles per second.

Type of Transmission: Pulse Modulated.

Power Output: Directly calibrated in decibels below 1 milliwatt over the range from -20 to -100 decibels.

Output Impedance: 50 ohms.

Internally Synchronized:

Trigger Frequency: 120 to 2000 cycles per second.

Pulse Width: Continuously variable from 0.75, or less, to 5.75 microseconds (at a repetition frequency range of 120 to 2000 cycles per second).

Pulse Delay: Continuously variable from a minimum of 5 microseconds to a maximum of 75% of the period between trigger pulses or 1800 microseconds, whichever of the two is smaller.

RF Pulse Shape: Essentially a square wave.

Rise Time: 0.25 (or less) microsecond from 10% to 90% maximum.

Fall Time: 0.7 (or less) microsecond from 90% to 10% maximum.

Externally Synchronized:

External Trigger Requirements:

Trigger Frequency: 120 to 2000 cycles per second.

Width: 0.5 to 18.0 microseconds measured at half voltage points.

Polarity: Either plus or minus.

Amplitude: From 15 to 100 volts across a load not exceeding 500,000 ohms.

Rise Time: Less than 0.2 microsecond rise time to 20 volts.

Pulse Width: Continuously variable from 0.75, or less, to 5.75 microseconds (at a repetition frequency range of 120 to 2000 cycles per second).

Pulse Delay: Continuously variable from a minimum of 5 microseconds to a maximum of 75% of the period between trigger pulses or 1800 microseconds, whichever of the two is smaller.

RF Pulse Shape: Essentially a square wave.

Rise Time: 0.25 (or less) microsecond from 10% to 90% maximum.

Fall Time: 0.7 (or less) microsecond from 90% to 10% maximum.

MANUFACTURERS' OR CONTRACTORS' DATA:

Boonton Radio Corporation, Boonton, New Jersey; Estimated Cost per Unit, $1816.74.

TUBE COMPLEMENT:

4 JAN-6SN7/GT, 1 JAN-6AG7, 1 JAN-2C40, 1 JAN-5Y3GT/G, 1 JAN-OD3/VR-150, 1 JAN-OC3/VR-105.

REFERENCE DATA AND LITERATURE:

TO 16-35TS155-6 (TM 11-2657B and Change 1.) (Instruction Book).

SIG 8-TS-155B/UP (ASF Catalog).

SIGNAL GENERATOR TS-155B/UP
(GENERATOR, SIGNAL, TS-155B/UP)

SHIPPING DATA:

No. of Boxes	Contents & Identification	Volume (Cu. Ft.)	Overall Dimensions (inches)			Weight Packed (Lbs.)
			H	W	D	
1	Signal Generator TS-155B/UP (Export Packed)	3.33	26	17	13	96

EQUIPMENT SUPPLIED:

Quant. Per Eq'pt	Name and Nomenclature	Case Mat'l	Stock Numbers (USAF) (Navy) (Army)	Overall Dimensions (inches)			Weight (Lbs.)
				H	W	D	
1	Signal Generator TS-155B/UP	Aluminum	7CAC-363976 3F4325-155B	16-3/4	9-1/2	11-3/8	34
1	Cord CG-70/MPM		7CAC-170265-43	180 long			1.5
1	Cord CG-71/MPM		7CAC-472692	72 long			0.7
1	Cord CX-145/MPM			360 long			1.5
1	Adapter UG-131/U		3300-28605405	5/8	5/8	1-1/2	0.06
1	RF Adapter UG-57B/U		8850-108741	3/4	3/4	2	0.12
1	Crystal Adapter UG-119/UP		3300-286054494	3/4	3/4	2	0.12
1	RF Adapter UG-28A/U		8850-108720	5/8	1-3/4	2-3/4	0.19
1	Tube (Crystal) 1N21B		3300-234137020				

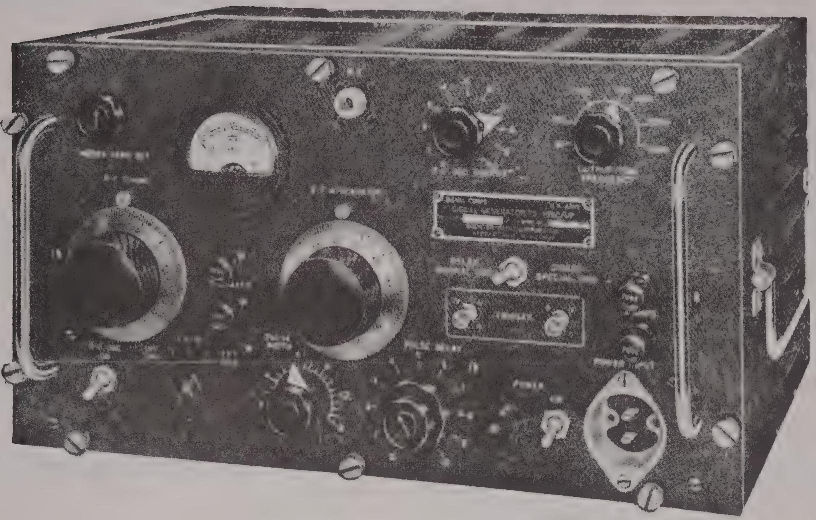
(Continued)

SIGNAL GENERATOR TS-155B/UP
(GENERATOR, SIGNAL, TS-155B/UP)

EQUIPMENT SUPPLIED: (Continued)

Quant. Per Eq'pt	Name and Nomenclature	Case Mat'l	Stock Numbers (USAF) (Navy) (Army)	Over-all Dimensions (inches)			Weight (Lbs.)
				H	W	D	
1	Antenna AT-67/AP		7CAC-657650	4-1/4	3-3/4	2	0.44
1	Allen Set Screw Wrench No. 8						
1	Bristow Set Screw Wrench No. 6						
1	Transit Case	Wood		12-3/4	21-3/4	11-3/4	23

SIGNAL GENERATOR TS-155C/UP
(GENERATOR, SIGNAL, TS-155C/UP)



FUNCTIONAL DESCRIPTION:

A portable, general purpose instrument used to check the overall system performance, receiver sensitivity, and power output of transmitters. The unit supplies trigger pulses for synchronization and provides for internal single pulsing, external double pulsing and variable delay. A radio frequency wattmeter is included. All controls and indicators are located on the front panel. Requires that the grid cylinder be changed for each of three bands.

RELATIONSHIP TO OTHER EQUIPMENT:

Similar to TS-155/UP, TS-155A/UP, and TS-155B/UP except that TS-155C/UP has (1) interchangeable grid cylinders which give it a wider frequency range, (2)a direct-delay switch has been provided which permits variable delay to be inserted or removed, and (3) TS-155C/UP is designed only for positive triggering.

	AIR FORCE	NAVY	ARMY
TYPE CLASS.			
STOCK NOS.	7CAC-363978	F16-G-63942-6291	3F4325-155C
PROCUREM'T INFO.:			
PROCUREM'T COG.: Army		DESIGN COG.: Army, ESL	
F.I.I.N.:		FUNCTIONAL CLASS. NO.: 10.1.4	
	- Electronics Test Equipment -		TS-155C/UP

This project was supported by the USAF on Contract AF 33(600)28276 and monitored by WADC, ARDC - Carl L. Frederick, Bethesda, Md. - Multilithed in U. S. A.

SIGNAL GENERATOR TS-155C/UP
(GENERATOR, SIGNAL, TS-155C/UP)

ELECTROMECHANICAL DESCRIPTION:

Power Supply: 105 to 125 volts, AC, single phase, 50 to 1600 cycles per second, 100 watts at 117.5 volts and 50 cycles per second. Provision is also made for 230 volt operation.

Frequency Range: 2700 to 3400 megacycles per second in three bands.

Type of Transmission: Pulsed Carrier.

Power Range: -20 to -100 dbm, output. +10 to +23 dbm, input.

Output Trigger Repetition Rate: 80 to 2600 pulses per second.

Output Trigger Amplitude: +10 to +50 volts (not adjustable).

Pulse Width: 0.75 to 5.75 microseconds internally synchronized.

Pulse Delay: 5 to 1800 microseconds, or 75% of period between pulses, whichever is smaller.

MANUFACTURERS' OR CONTRACTORS' DATA:

Boonton Radio Company, Boonton, New Jersey; Order No. MIPR-49-425C, 1948; Approximate Cost per Unit, $2228.67.

TUBE COMPLEMENT:

1 JAN-5Y3GT, 1 JAN-OD3/VR-150, 1 JAN-OC3/VR-105, 4 JAN-6SN7, 1 JAN-6AG7, 1 JAN-2C40.

REFERENCE DATA AND LITERATURE:

TO 16-35TS155-5 (Instruction Book).
TO 16-55-410 (TM 11-2657C) (Spare Parts List).

SHIPPING DATA:

No. of Boxes	Contents & Identification	Volume (Cu. Ft.)	Over-all Dimensions (inches)			Weight Packed (Lbs.)
			H	W	D	
1	Signal Generator TS-155C/UP with accessories (Domestic Packed - Water Resistant)	4.80	15	29	19	120

SIGNAL GENERATOR TS-155C/UP
(GENERATOR, SIGNAL, TS-155C/UP)

EQUIPMENT SUPPLIED:

Quant. Per Eq'pt	Name and Nomenclature	Case Mat'l	Stock (USAF) Numbers (Navy) (Army)	Over-all Dimensions (inches)			Weight (Lbs.)
				H	W	D	
1	Signal Generator TS-155C/UP	Metal	7CAC-363978 F16-G-63942-6291 3F4325-155C	9	16-3/4	12-3/4	41
1	Grid Cylinder MX-678/UP (2900-3100 mcs)		7CPV-58-5366C 2Z3600C-678	7/8	7/8	1-5/8	0.06
1	Grid Cylinder MX-679/UP (3100-3400 mcs)		7CPV-58-5366C 2Z3600C-679	7/8	7/8	1-5/8	0.06
1	Grid Cylinder MX-680/UP (2700-2900 mcs)		7CPV-58-5366V 2Z3600C-680	7/8	7/8	1-5/8	0.06
2	Cord, Radio Frequency CG-92/UP		7CAC-170265-465 1F430-92.96	96 long			
2	Cord (Trigger) CG-409/U		7CAC-170265-395 1F430-409.96	96 long			
1	Cord (power) CX-337/U		7CAC-170264-86 3E6000-337-72	72 long			
1	Adapter (Radio Frequency) UG-28/U		8800-108730 R16-A-565 2Z7390-28	5/8	1-3/4	3-1/32	0.19
1	Adapter (Radio Frequency) UG-57/U		8850-108740 2Z7390-57	3/4	3/4	2-3/64	0.125
1	Adapter (Radio Frequency) UG-29/U		8850-108732 2Z7390-29	5/8	5/8	2-3/16	0.125
1	Adapter (Crystal) UG-119/UP		3300-286054494 R16-AN-UG119/UP 2Z308-119	3/4	3/4	2	0.125
2	Adapter UG-255/U		8850-108880 2Z308-255	1-5/32	1-5/32	1-3/64	0.125

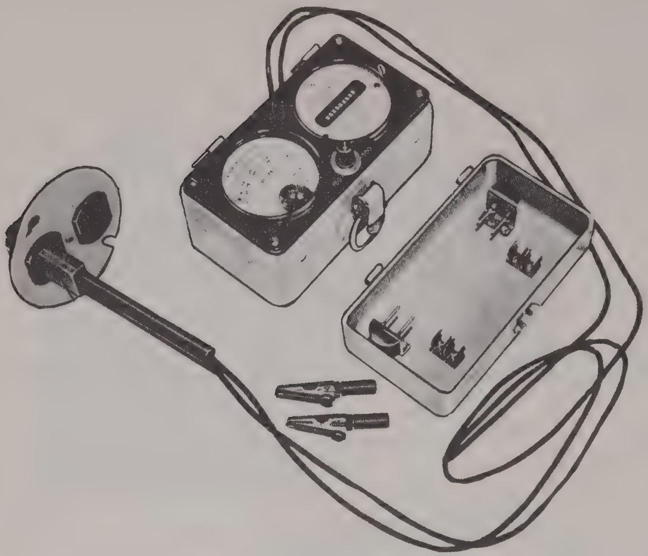
(Continued)

SIGNAL GENERATOR TS-155C/UP
(GENERATOR, SIGNAL, TS-155C/UP)

EQUIPMENT SUPPLIED: (Continued)

Quant. Per Eq'pt	Name and Nomenclature	Case Mat'l	Stock Numbers (USAF) (Navy) (Army)	Over-all Dimensions (inches)			Weight (Lbs.)
				H	W	D	
2	Adapter UG-273/U		8850-102000 2Z308-273	1-5/32	1-5/32	1-1/32	0.125
1	Adapter UG-131/U		3300-286054505 2Z308-131	5/8	5/8	1-35/64	0.06
1	Crystal 1N21B		3300-234137020 2J1N21B				
1	Horn Antenna AT-67/AP		7CAC-657650 3F3988-67	4-1/4	3-3/4	2	0.44
1	Transit Case CY-530/UP	Metal	3F2529-530	10-3/8	21	15-1/4	30
1	Instruction Book TM 11-2657C						
1	Wrench, Hex "L" Shaped		7900-859500 6R55496				
1	Wrench, Hex "L" Shaped		7900-859460 6R55499				
1	Wrench, 5/64		7900-859490 6R57400				
1	Wrench, Hex "L" Shaped		7900-859480 6R57400-6				

TEST SET, ELECTRICAL POWER AN/UPM-93



FUNCTIONAL DESCRIPTION:

A portable, general purpose test set used in monitoring electrical power supplied to a radar set from a remote source. Results are obtained from an AC voltmeter and a frequency meter mounted on the front panel.

RELATIONSHIP TO OTHER EQUIPMENT:

AN/UPM-93 is similar to Winslow Model 364 Volt and Frequency Meter. Similar to TS-328/U with the addition of an AC voltmeter.

ELECTROMECHANICAL DESCRIPTION:

Circuit Information: The test set circuitry essentially consists of an AC voltmeter and a vibrating reed frequency meter.

Power Supply: None

Frequency Meter:

Range: 380 to 420 cycles per second.

Accuracy: ±0.5%.

Voltmeter:

Range: 0 to 150, 300 volts, AC.

(Continued)

	AIR FORCE	NAVY	ARMY
TYPE CLASS.	Standard		
STOCK NOS.			
PROCUREM'T INFO.:			
PROCUREM'T COG.: Army		DESIGN COG.: Army	
F.I.I.N.: 6625-581-2097		FUNCTIONAL CLASS. NO.: 10.1.5	
	- Electronics Test Equipment -		AN/UPM-93

TEST SET, ELECTRICAL POWER AN/UPM-93

ELECTROMECHANICAL DESCRIPTION: (Continued)
Operating Frequency: 400 cycles per second.
Accuracy: ±2% full scale.

MANUFACTURERS' OR CONTRACTORS' DATA:
Winslow Company, Incorporated, Lehigh Avenue, Union, New Jersey.

TUBE COMPLEMENT:
None

REFERENCE DATA AND LITERATURE:
Technical Bulletin TB Sig 318.

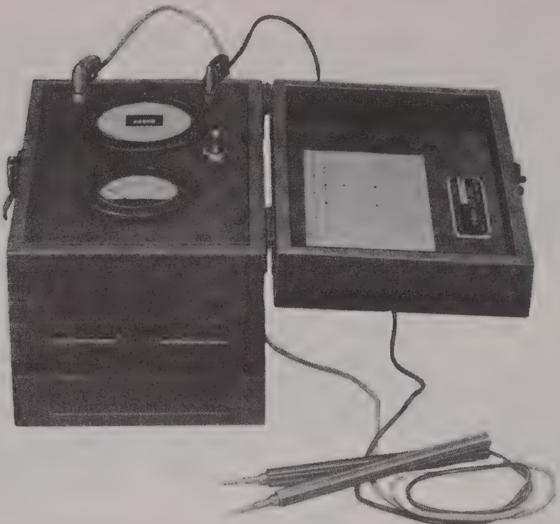
EQUIPMENT SUPPLIED:

Quant. Per Eq'pt	Name and Nomenclature	Case Mat'l	Stock Numbers (USAF) (Navy) (Army)	Overall Dimensions (inches)			Weight (Lbs.)
				H	W	D	
1	Test Set, Electrical Power AN/UPM-93 Including:	metal		3-5/8	6-1/4	3-1/4	3
1	Adapter Connector U-175/U						
1	Test Set, Electrical Power TS-934/U						

SHIPPING DATA:

No. of Boxes	Contents & Identification	Volume (Cu. Ft.)	Overall Dimensions (inches)			Weight Packed (Lbs.)
			H	W	D	
	Test Set, Electrical Power AN/UPM-93					

TEST SET I-209-B
(TEST SET, RADIO, I-209-B)



FUNCTIONAL DESCRIPTION:

A portable, general purpose, test equipment designed to test the voltage and frequency of power units. The unit is calibrated in cycles per second and in volts AC.

RELATIONSHIP TO OTHER EQUIPMENT:

ELECTROMECHANICAL DESCRIPTION:

Circuit Information: Consists of a vibrating-reed type frequency meter and a single scale, fixed range, dynamometer type voltmeter.
Power Supply: None required.
Frequency Range: 58 to 62 cycles per second.
Voltage Range: 0 to 150 alternating volts.
Accuracy: Voltage: ±2% full scale.
Frequency: ±0.3%.

(Continued)

	AIR FORCE	NAVY	ARMY
TYPE CLASS.	Standard		
STOCK NOS.	7CAC-801317-5965		3F4190-209B
PROCUREM'T INFO.: Army Spec. No. 71-1661, Dwg. No. SC-D-6665			
PROCUREM'T COG.: Army		DESIGN COG.: Army, ESL	
F.I.I.N.:		FUNCTIONAL CLASS. NO.: 10.1.5	

This project was supported by the USAF on Contract AF 33(600)28276 and monitored by WADC, ARDC - Carl L. Frederick, Bethesda, Md. - Multilithed in U. S. A.

TEST SET I-209-B
(TEST SET, RADIO, I-209-B)

MANUFACTURERS' OR CONTRACTORS' DATA:

Columbus Electronics Corporation, 229 S. Waverly Street, Yonkers, New York; Order No. 25387-Phila-49-2.

Bird Engineering Company, 1000 E. 38th Street, Cleveland 14, Ohio; Order No. 1317-DAY-44; Approximate Cost per Unit, $29.00.

TUBE COMPLEMENT:

None.

REFERENCE DATA AND LITERATURE:

TO 16-40 I209-5 (TM 11-2501) (Instruction Book).
TO 16-40 I209-6 (TB11-2501-1) (Installation Instructions).

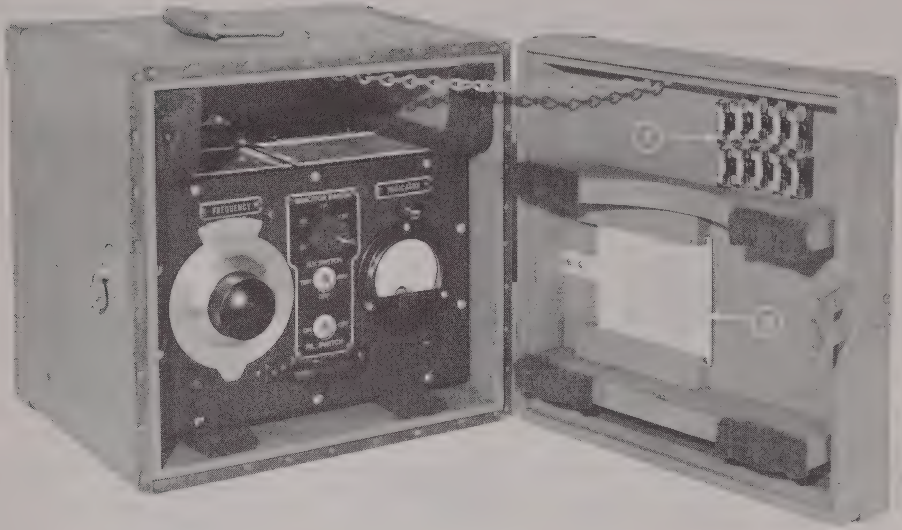
SHIPPING DATA:

No. of Boxes	Contents & Identification	Volume (Cu. Ft.)	Overall Dimensions (inches)			Weight Packed (Lbs.)
			H	W	D	
1	Test Set, I-209-B with accessories (Packed for Export Shipment)	0.65	9	9	14	12

EQUIPMENT SUPPLIED:

Quant. Per Eq'pt	Name and Nomenclature	Case Mat'l	Stock Numbers (USAF) (Navy) (Army)	Overall Dimensions (inches)			Weight (Lbs.)
				H	W	D	
1	Test Set I-209-B	Ply-wood	7CAC-801317-5965 3F4190-209B	5-3/4	6-1/4	8-15/16	4.5
1	Set of Test Leads CX-1331/U		7CAC-468919-83 3E8000-51	52 long			
1	Adapter Connector			3 long	1-1/2 dia.		0.125

TEST SET TS-41/CRN-1



FUNCTIONAL DESCRIPTION:

A portable unit used for operating test and maintenance of Radio Transmitter T-2/CRN-1. Measures frequency, battery voltage and current, and transmitter antenna current.

Resonance is indicated by a dip of the meter reading. The tuning dial reading is then converted to frequency by referring to a calibrated chart. Voltage and currents are read directly from the indicator meter.

RELATIONSHIP TO OTHER EQUIPMENT:

ELECTROMECHANICAL DESCRIPTION:

Power Supply: Obtained from equipment under test.
Type of Reception: Continuous Wave, Modulated Carrier Wave.
Frequency Range: 1400 kilocycles to 1750 kilocycles.
Meter Range: 0 to 1.0 milliampere.

	AIR FORCE	NAVY	ARMY
TYPE CLASS.			
STOCK NOS.	1690-327878500	ASO-R16-AN-TS-41-CRN-1	3F4325-41
PROCUREM'T INFO.:	USAF Spec. No. 71-1761		
PROCUREM'T COG.:	USAF	DESIGN COG.:	USAF, C&N
F.I.I.N.:		FUNCTIONAL CLASS. NO.:	10.1.5
	- Electronics Test Equipment -		TS-41/CRN-1

This project was supported by the USAF on Contract AF 33(600)28276 and monitored by WADC, ARDC - Carl L. Frederick, Bethesda, Md. - Multilithed in U. S. A.

TEST SET TS-41/CRN-1

MANUFACTURERS' OR CONTRACTORS' DATA:

Wells-Gardner and Company, Chicago, Illinois; Order No. 4017-DAY-45-SE; Order No. 998-DAY-45, 7 February 1945; Approximate Cost per Unit, $196.00; Order No. 4135-45-CN, 31 March 1945; Approximate Cost per Unit, $187.00.

TUBE COMPLEMENT:

REFERENCE DATA AND LITERATURE:

AN 08-35TS41-2 (Maintenance Instructions).

SHIPPING DATA:

No. of Boxes	Contents & Identification	Volume (Cu. Ft.)	Overall Dimensions (inches)			Weight Packed (Lbs.)
			H	W	D	
1	Test Set TS-41/CRN-1 (Domestic Packed)	1				

EQUIPMENT SUPPLIED:

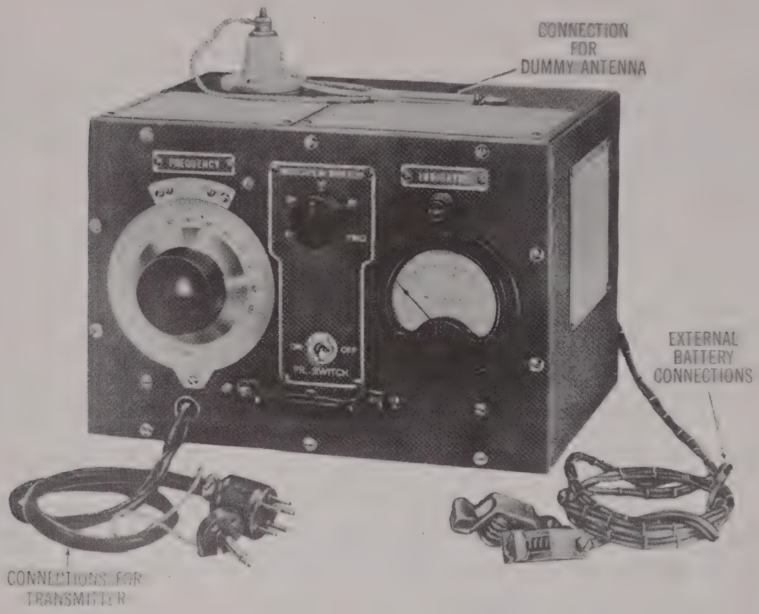
Quant. Per Eq'pt	Name and Nomenclature	Case Mat'l	Stock Numbers (USAF) (Navy) (Army)	Overall Dimensions (inches)			Weight (Lbs.)
				H	W	D	
1	Test Set TS-41/CRN-1 (Complete)		1690-327878500 R16-AN-TS-41-CRN-1 3F4325-41	9.375	11.125	9.5	12.5
1	Stand MX-176/CRN-1		1690-327305733 3F3989-176	29.5	29.5	37.5	27.13
1	Dummy Antenna TS-181/CRN-1		7CAC-274378 2A203A-181	44.125	3.5		3.68
1	Socket Wrench 1/4 in. standard		7900-866370 6R57413-3	6 long			0.125

TEST SET TS-41/CRN-1

EQUIPMENT SUPPLIED:

Quant. Per Eq'pt	Name and Nomenclature	Case Mat'l	Stock Numbers (USAF) (Navy) (Army)	Over-all Dimensions (inches)			Weight (Lbs.)
				H	W	D	
1	Screwdriver		7900-664010 6R15751-1	4.5 long			
10	Spare Fuse 8AG		8800-360880 3Z2571	1.0	0.250 dia.		
1	Case (for accessories) CY-148/CRN-1		1690-328630002 3F2529-148	49.3125	7.375	33.5	80
1	Case for metering equipment CY-147/CRN-1		1690-328630000 3F2529-147	13.125	14	13.5	18
1	Assembly Tool MX-201/CRN-1	Metal	3300-671052815 6Q495-201	19.94	7.76		2.87
1	Assembly Tool MX-179/CRN-1	Metal	3300-671052790 6Q495-179	19.875	7.59		2.87
1	Code Selector Tool MX-178/CRN-1		6Q28830-178	25.25			0.75

TEST SET TS-456/CRN-1A
(TEST SET, RADAR, TS-456/CRN-1A)


CONNECTION FOR DUMMY ANTENNA
FREQUENCY
ON
OFF
FIL. SWITCH
EXTERNAL BATTERY CONNECTIONS
CONNECTIONS FOR TRANSMITTER

FUNCTIONAL DESCRIPTION:

A portable unit, requiring only a six-volt storage battery, used for operating test and maintenance of radio transmitters.

Consists not only of a meter and associated resistors to measure battery voltage and currents and transmitter antenna current, but also of an antenna tank coil assembly and rectifier bridge circuit, comprising an absorption type wavemeter. Resonance is indicated by a dip of the meter reading and then the tuning dial is read against a calibrated chart for frequency determination.

RELATIONSHIP TO OTHER EQUIPMENT:

This Test Set cannot be used to test Radio Transmitting Equipment AN/CRN-1.

ELECTROMECHANICAL DESCRIPTION:

Power Supply: One six-volt storage battery.
Type of Reception: Continuous Wave or Modulated Carrier Wave.

(Continued)

	AIR FORCE	NAVY	ARMY
TYPE CLASS.	Limited Standard		
STOCK NOS.	7CAC-801319-2563		3F4325-456
PROCUREM'T INFO.:			
PROCUREM'T COG.: USAF		DESIGN COG.: USAF, C&N	
F.I.I.N.:		FUNCTIONAL CLASS. NO.: 10.1.5	
	- Electronics Test Equipment -		TS-456/CRN-1A

This project was supported by the USAF on Contract AF 33(600)28276 and monitored by WADC, ARDC - Carl L. Frederick, Bethesda, Md. - Multilithed in U. S. A.

TEST SET TS-456/CRN-1A
(TEST SET, RADAR, TS-456/CRN-1A)

ELECTROMECHANICAL DESCRIPTION: (Continued)

Frequency Range: 1400 kilocycles to 1750 kilocycles.

MANUFACTURERS' OR CONTRACTORS' DATA:

Wells-Gardner Company, 2701 North Kildare Avenue, Chicago 39, Illinois; Order Nos. 998-DAY-45, 4135-DAY-45, 4013-DAY-45, 4017-DAY-45; dated June 1945; Approximate Cost per Unit, $432.00, 3 May 1953.

TUBE COMPLEMENT:

None.

REFERENCE DATA AND LITERATURE:

AN 16-35TS456-3 (Maintenance Instructions).

SHIPPING DATA:

No. of Boxes	Contents & Identification	Volume (Cu. Ft.)	Overall Dimensions (inches)			Weight Packed (Lbs.)
			H	W	D	
1	Test Set, TS-456/CRN-1A including Case CY-147/CRN-1 and 10 Fuses 8AG. (Packed in Water Resistant Carton)	3.56	19	18	18	41
1	Case, CY-148/CRN-1, including Stand MX-176/CRN-1, Dummy Antenna TS-181/CRN-1, Socket Wrench and Screwdriver	8.18	52	8.0	34	150

EQUIPMENT SUPPLIED:

Quant. Per Eq'pt	Name and Nomenclature	Case Mat'l	Stock Numbers (USAF) (Navy) (Army)	Overall Dimensions (inches)			Weight (Lbs.)
				H	W	D	
1	Test Set TS-456/CRN-1A	Metal	7CAC-801319-2563 3F4325-456	11-1/8	9-1/2	9-3/8	12.56
1	Case CY-147/CRN-1		3F2529-147	13-1/8	14	13-1/2	18.00
10	Fuse 8AG		8800-360880 3Z2571				

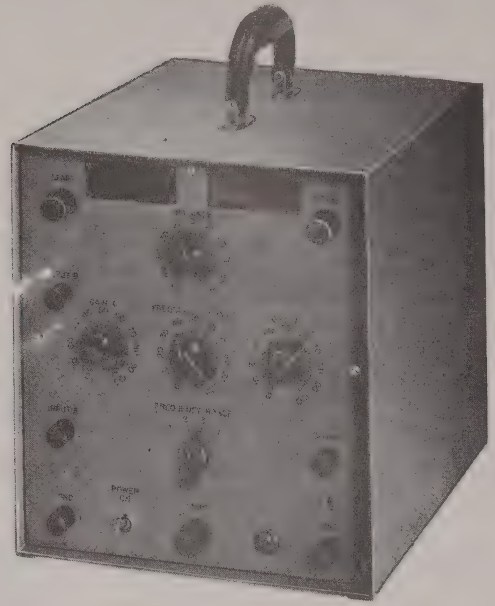
(Continued)

TEST SET TS-456/CRN-1A
(TEST SET, RADAR, TS-456/CRN-1A)

EQUIPMENT SUPPLIED: (Continued)

Quant. Per Eq'pt	Name and Nomenclature	Case Mat'l	Stock Numbers (USAF) (Navy) (Army)	Over-all Dimensions (inches)			Weight (Lbs.)
				H	W	D	
1	Case CY-148/CRN-1	Metal	1690-328630002 3F2529-148	49.312	7-1/2	33-1/2	80.00
1	Stand MX-176/CRN-1	Metal	1690-327305733 3F3989-176	29-1/2	29-1/2	37-1/2	27.13
1	Dummy Antenna TS-181/CRN-1	Aluminum	7CAC-274378 2A203A-181	44-1/8	3-1/2 dia.		3.68
1	Socket Wrench			6			0.12
1	Screwdriver				1/4 dia.		0.12

ELECTRONIC SWITCH TS-433B/U



FUNCTIONAL DESCRIPTION:

A portable, general purpose, combination test set which includes an electronic switch, a square wave generator and a signal amplifier in a single housing. The electronic switch makes possible the simultaneous observation of two recurrent patterns on the screen of a single cathode ray oscilloscope by providing two independent time bases. Direct comparisons of amplitudes, waveforms, frequencies, and phase relationships may be observed.

A square wave voltage of variable frequency and amplitude is available at the output terminals for use as a test signal in studying the transmission characteristics of vacuum-tube amplifiers or other circuits.

Direct coupled amplifiers are designed for "chopping" a DC signal making it suitable for transmission through the AC amplifiers which usually are found in oscilloscopes.

	AIR FORCE	NAVY	ARMY
TYPE CLASS.	Standard		
STOCK NOS.	7CAC-277900		3F3917
PROCUREM'T INFO.: MIL-E-11702A			
PROCUREM'T COG.: Army		DESIGN COG.: Army, CSL	
F.I.I.N.:		FUNCTIONAL CLASS. NO.: 10.1.7	
- Electronics Test Equipment -			TS-433B/U

This project was supported by the USAF on Contract AF 33(600)28276 and monitored by WADC, ARDC - Carl L. Frederick, Bethesda, Md. - Multilithed in U. S. A.

ELECTRONIC SWITCH TS-433B/U

RELATIONSHIP TO OTHER EQUIPMENT:

Similar to Allen B. DuMont Laboratories Inc., Type 185-A Electronic Switch; and Dubrow Development Co., Model 118 Electronic Switch.

ELECTROMECHANICAL DESCRIPTION:

Circuit Information: The circuit consists of a multivibrator, a keyer stage, two signal amplifiers, and a full wave rectifier. The multivibrator is a twin-triode tube connected to be balanced and free-running. Two square wave output voltages 180° apart are obtained and connected to a keying (or switching) tube.

The keyer is a twin-triode tube with the input of each section connected to an output of the multivibrator. Since the input voltages to the grids of the keyer stage are 180° out of phase, one section of the tube conducts while the other section is inoperative. Each section is connected to a separate amplifier.

The two amplifier tubes are keyed alternately which causes the two signals to be displayed alternately on the oscilloscope. The balance control causes the wave forms to be separated or superimposed for comparison purposes. When the equipment is used as a square wave generator, the balance control is used to vary the amplitude of the square wave.

Power Supply: 115 volts ±10% or 230 volts ±10%, AC, 50 to 60 cycles per second, single phase, 30 watts.

Electronic Switch:

Switching Rate: Continuously variable, 10 to 2000 times per second.

Square Wave Generator:

Range: Continuously variable, useful 10 to 500 cycles per second.

Amplitude: Continuously variable to at least 30 volts, peak to peak.

Rise Time: Less than 25 microseconds at 500 cycles per second.

Signal Amplifier:

Frequency Response: Uniform from 0 to 5000 cycles per second within ±1 decibel with amplifier at full gain. At 25 kilocycles per second, response is not more than 25% down from response at 1 kilocycle per second.

Input Voltage Ratings: Maximum input at maximum attenuation, 150 rms volts; with no attenuation, 2.5 volts rms at balance and 1.5 volts rms at maximum balance.

Maximum Signal Output: 75 volts peak to peak at balance.

Gain: 10 times.

Attenuation: Continuously variable.

Phase Shift: 2° at 1 kilocycle per second and 35° at 25 kilocycles per second output as compared to the input signal to the attenuator.

Input Impedance: 100,000 ohms ±10%.

Output Impedance: 50,000 ohms at full gain.

MANUFACTURERS' OR CONTRACTORS' DATA:

Dubrow Development Company, 235 Penn Street, Burlington, New Jersey; Order No. 10172-Phila-50-2; Contract No. AF 14589, 29 June 1950; Approximate Cost per Unit, $1480.00.

ELECTRONIC SWITCH TS-433B/U

TUBE COMPLEMENT:

2 JAN-6SN7WGT, 2 JAN-6SJ7WGT, 1 JAN-5Y3GT.

REFERENCE DATA AND LITERATURE:

TO 16-35TS433-5 (TM 11-5049) (Instruction Book).

SHIPPING DATA:

No. of Boxes	Contents & Identification	Volume (Cu. Ft.)	Overall Dimensions (inches)			Weight Packed (Lbs.)
			H	W	D	
1	Electronic Switch TS-433B/U (Export Packed)	2. 18	15-1/2	13-1/2	18	55

EQUIPMENT SUPPLIED:

Quant. Per Eq'pt	Name and Nomenclature	Case Mat'l	Stock Numbers (USAF) (Navy) (Army)	Over-all Dimensions (inches)			Weight (Lbs.)
				H	W	D	
1	Electronic Switch TS-433B/U	Metal	7CAC-277900 3F3917	10	8-3/4	13	24
2	Technical Manuals TM 11-5049			9-1/8	5-7/8		
2	Fuse 1 amp Type 3AG		8800-361200 3Z1926				
1	Tube JAN-6SN7WGT						
1	Tube JAN-6SJ7WGT						
1	Tube JAN-5Y3GT						

RADAR TEST SET AN/UPM-12

FUNCTIONAL DESCRIPTION:

A general purpose, portable, voltage standing wave ratio instrument. It consists of a signal generator, power supply, dummy load, and a linear amplifier with voltage standing wave ratio indicator.

RELATIONSHIP TO OTHER EQUIPMENT:

Similar to Sperry Model 539.

ELECTROMECHANICAL DESCRIPTION:

Circuit Information: The standing wave ratio indicator measures the reflection coefficient by measuring attenuation through the contained RF bridge by means of a built-in calibrator. The attenuator is calibrated by use of the dummy load.

Power Input: 115 volts ±10%, AC, single phase, 50 to 800 cycles per second, 76 watts.

Type of Transmission: Pulse.

Indicator:

Frequency Range: 8500 to 9600 megacycles per second.

Pulse Recurrence Frequency: 1300 to 1500 cycles per second.

Signal Strength: 125 microwatts minimum.

Meter Scales: 1.05 to 1.3, ±5%; 1.3 to 2.0, ±10%; 2.0 to 3.0, ±10%; calibrated

(Continued)

	AIR FORCE	NAVY	ARMY
TYPE CLASS.	Standard		
STOCK NOS.			
PROCUREM'T INFO.:	USAF Exhibit No. WLENG-11445; Spec. No. MIL-R-8724		
PROCUREM'T COG.:	USAF	DESIGN COG.:	USAF, C&N
F.I.I.N.:		FUNCTIONAL CLASS. NO.:	10.1.8
	- Electronics Test Equipment -		AN/UPM-12

This project was supported by the USAF on Contract AF 33(600)28276 and monitored by WADC, ARDC - Carl L. Frederick, Bethesda, Md. - Multilithed in U. S. A.

RADAR TEST SET AN/UPM-12

ELECTROMECHANICAL DESCRIPTION: (Continued)

in voltage standing wave ratio.

Power Supply:

Output: 300 volts, DC, regulated within 1% ripple (less than 5 millivolts).

Dummy Load:

Power Dissipation: 125 microvolts.

Frequency Range: 8500 to 9600 megacycles per second.

MANUFACTURERS' OR CONTRACTORS' DATA:

Sperry Gyroscope Company, Great Neck, Long Island, New York; Contract No. AF 33(604)8347 (1954).

TUBE COMPLEMENT:

Power Supply: 1 JAN-5Y3, 1 JAN-6X4, 1 JAN-6AQ5, 1 JAN-6AU6, 1 JAN-5651, 1 JAN-12AU7, 2 JAN-OB2.

RF Bridge: 1 JAN-2K25, 1 JAN-12AT7, 1 JAN-6AV6, 1 JAN-5751, 1 JAN-6AU6.

REFERENCE DATA AND LITERATURE:

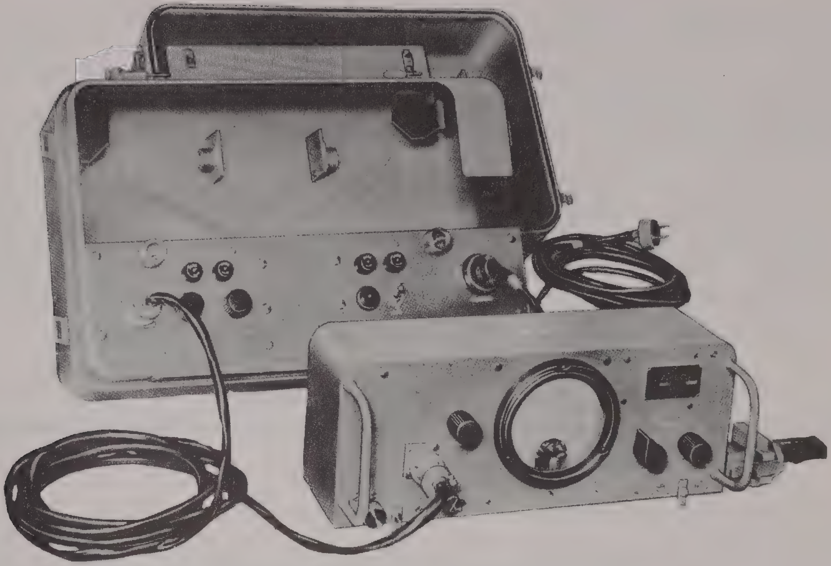
SHIPPING DATA:

No. of Boxes	Contents & Identification	Volume (Cu. Ft.)	Over-all Dimensions (inches)			Weight Packed (Lbs.)
			H	W	D	

EQUIPMENT SUPPLIED:

Quant. Per Eq'pt	Name and Nomenclature	Case Mat'l	Stock Numbers (USAF) (Navy) (Army)	Over-all Dimensions (inches)			Weight (Lbs.)
				H	W	D	
1	Radar Test Set AN/UPM-12 Containing:	Aluminum		19-3/16	11-3/4	10-3/32	36
1	Amplifier Indicator IM-104/UPM-12			17	11-3/4	5-3/4	
1	Power Supply PP-1227/UPM-12			17	11-3/4	4-1/2	
1	Dummy Load DA-111/UPM-12			1-5/8	1-5/8	2-11/16	
1	Power Cord CX-237/U		7CAC-170264-485	72 long			
1	Cable Assembly			144 long			
1	Adapter UG-153/U						

DETECTOR, STANDING WAVE
Part No. 539
(Sperry Gyroscope Company)



FUNCTIONAL DESCRIPTION:

This is a portable, general purpose instrument used in measuring the voltage standing wave ratios of radar systems in the field and in the laboratory.

RELATIONSHIP TO OTHER EQUIPMENT:

The AN/UPM-12 Radar Test Set is the militarized revision.

ELECTROMECHANICAL DESCRIPTION:

Circuit Information: The detector utilizes the reflectometer principle indicating the voltage standing wave ratio by measuring the energy reflected from the apparatus under test. The test set can also serve as a source of square-wave modulated signal. The circuit includes a klystron oscillator, a directional coupler, a detec-

(Continued)

	AIR FORCE	NAVY	ARMY
TYPE CLASS.			
STOCK NOS.	7CAC-801319-22322		
PROCUREM'T INFO.:			
PROCUREM'T COG.:		DESIGN COG.: Commercial	
F.I.I.N.:		FUNCTIONAL CLASS. NO.: 10.1.8	
	- Electronics Test Equipment -		Sperry 539

This project was supported by the USAF on Contract AF 33(600)28276 and monitored by WADC, ARDC - Carl L. Frederick, Bethesda, Md. - Multilithed in U. S. A

DETECTOR, STANDING WAVE
Part No. 539
(Sperry Gyroscope Company)

ELECTROMECHANICAL DESCRIPTION: (Continued)

Circuit Information: (Continued)
tor, an amplifier stage, an indicator, a modulator and a power supply. The indicator meter and controls are located on the front panel.

Power Supply: 105 to 125 volts, 50 to 1,000 cycles per second, single-phase, AC, 76 watts at 0.9 ampere.

VSWR Ranges: 1.05 to 1.3; 1.3 to 2.0; 2.0 to 3.0; 3.0 to 10.0 (uncalibrated).

Accuracy: 1.05 to 1.3 range, ±5%; 1.3 to 2.0 range, ±10%; 2.0 to 3.0 range, ±10%.

Frequency Range: 8500 to 9600 megacycles per second.

Power Output: Approximately 125 microwatts.

Waveguide Output Connection: RG-52/U or RG-51/U through the waveguide adapter.

MANUFACTURERS' OR CONTRACTORS' DATA:

Sperry Gyroscope Company, Division of the Sperry-Rand Corporation, Great Neck, Long Island, New York.

TUBE COMPLEMENT:

1 JAN-5Y3, 1 JAN-6X4, 1 JAN-6AQ5, 1 JAN-6AU6, 1 JAN-5651, 1 JAN-12AU7, 2 JAN-OB2.

REFERENCE DATA AND LITERATURE:

Sperry Data Sheet "Microline Instruments, Standing-Wave Indicator Set."

SHIPPING DATA:

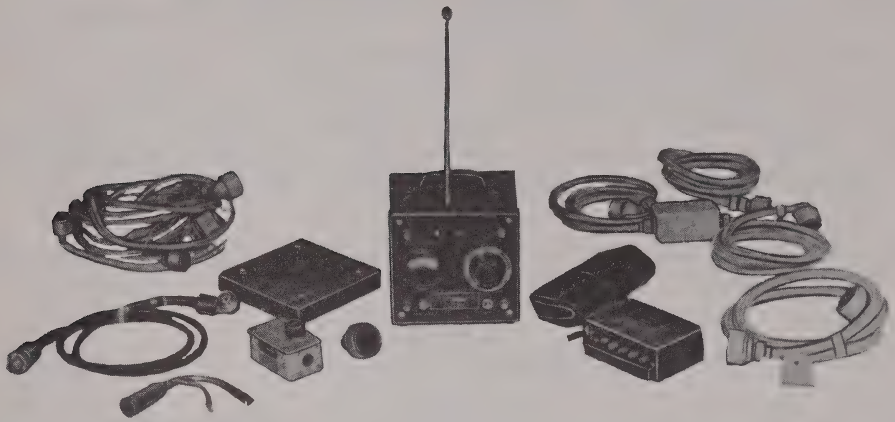
No. of Boxes	Contents & Identification	Volume (Cu. Ft.)	Overall Dimensions (inches)			Weight Packed (Lbs.)
			H	W	D	

DETECTOR, STANDING WAVE
Part No. 539
(Sperry Gyroscope Company)

EQUIPMENT SUPPLIED:

Quant. Per Eq'pt	Name and Nomenclature	Case Mat'l	Stock Numbers (USAF) (Navy) (Army)	Overall Dimensions (inches)			Weight (Lbs.)
				H	W	D	
1	Detector, Standing Wave (Sperry 539)	Aluminum	7CAC-801319-22322	19-1/4	12	10-1/4	35
	Including:						
1	Power Cord						
1	Interconnecting Cable Assembly						
1	Reference Mismatch						
1	Waveguide Adapter						
1	Allen Wrench						

TEST EQUIPMENT IE-12-A
(TEST SET, RADIO, IE-12-A)



FUNCTIONAL DESCRIPTION:

A combination test equipment used to test airborne very high frequency communications equipment at a base or depot. This set simulates a complete set of radio communications equipment. See data sheets on individual component equipments for detailed information regarding calibration, ranges, etc.

RELATIONSHIP TO OTHER EQUIPMENT:

Used with very high frequency equipment such as SCR-522.

ELECTROMECHANICAL DESCRIPTION:

Circuit Information: This test set is essentially a signal generator, field strength meter and the necessary mountings, assemblies, etc. The field strength meter is battery operated. It uses a diode rectifier tube, and the field intensity is read on a meter. For more detailed description, refer to I-96-A (Signal Generator) and I-95-A (Field Strength Meter) data sheets.

Power Supply: I-96-A: 135 volts supplied by six Batteries, BA-2 (22.5 volts), and

(Continued)

	AIR FORCE	NAVY	ARMY
TYPE CLASS.	Limited Standard		
STOCK NOS.	1690-327055900	ASO-R16-T-1822	3F3922A
PROCUREM'T INFO.:			
PROCUREM'T COG.: USAF		DESIGN COG.: USAF, C&N	
F.I.I.N.:		FUNCTIONAL CLASS. NO.: 10.1.9	
	- Electronics Test Equipment -		IE-12-A

This project was supported by the USAF on Contract AF 33(600)28276 and monitored by WADC, ARDC - Carl L. Frederick, Bethesda, Md. - Multilithed in U. S. A.

TEST EQUIPMENT IE-12-A
(TEST SET, RADIO, IE-12-A)

ELECTROMECHANICAL DESCRIPTION: (Continued)

6 volts supplied by four Batteries, BA-23 (1.5 volts); or 110 to 115 volts AC, 50 to 60 cycles, single phase. I-95-A: 45 volts supplied by two Batteries, BA-2 (22.5 volts) and 1.5 volts supplied by one Battery, BA-23 (1.5 volts).

Intermediate Frequency Range: 12 megacycles per second only.

Frequency Range: 100 to 156 megacycles per second (Signal Generator).

Output Voltage: 0 to 5000 microvolts, uncalibrated.

Sensitivity: -3 to 4 microvolts for 10 decibels signal to noise ratio.

MANUFACTURERS' OR CONTRACTORS' DATA:

Bendix, Baltimore 4, Maryland; Order No. 151-42, 16 May 1942; Approximate Cost per Unit, $1420.00; Contract No. 12101-WF-43, 30 June 1943.

TUBE COMPLEMENT:

Signal Generator: 2 JAN-9002, 4 JAN-9003, 1 JAN-OD3/VR150, 1 JAN-5Y3GT/G.
Field Strength Meter: 1 JAN-1S5.

REFERENCE DATA AND LITERATURE:

TO 16-40IE12-3 (Instruction Book).

SHIPPING DATA:

No. of Boxes	Contents & Identification	Volume (Cu. Ft.)	Overall Dimensions (inches)			Weight Packed (Lbs.)
			H	W	D	

EQUIPMENT SUPPLIED:

Quant. Per Eq'pt	Name and Nomenclature	Case Mat'l	Stock Numbers (USAF) (Navy) (Army)	Overall Dimensions (inches)			Weight (Lbs.)
				H	W	D	
1	Test Equipment IE-12-A Including:		1690-327055900 R16-T-1822 3F3922A				
1	Signal Generator, I-96-A, in case		1690-326986000 R16-AYS-I-96A 3F3896A	26-1/2	19	9-1/2	82
1	Case, CS-80-A containing the following equipment:		1600-286758500 R16-C-15879-100 2S522.2	16-5/32	12-9/16	10-11/16	43 to 49
1	Field Strength Meter, I-95-A		1690-326190000 R16-AYS-I-95A 3F2725A	7-1/4	8-1/2	7-5/16	10.7

(Continued)

TEST EQUIPMENT IE-12-A
(TEST SET, RADIO, IE-12-A)

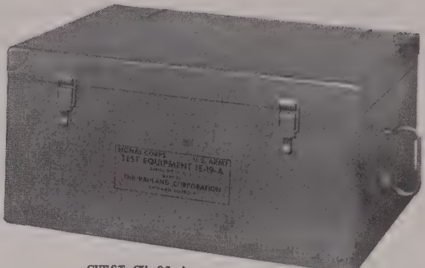
EQUIPMENT SUPPLIED: (Continued)

Quant. Per Eq'pt	Name and Nomenclature	Case Mat'l	Stock Numbers (USAF) (Navy) (Army)	Over-all Dimensions (inches)			Weight (Lbs.)
				H	W	D	
1	Dynamotor 28 volt PE-94-CM		1600-341087520 R16-D-5795 3H1894-CM	12-25/32	8-27/32	6-15/64	31.2 to 37
1	Control Box BC-602A		1600-214770000 R16-AYS-BC-602A 2C3347A	5-7/8	5-9/16	2-1/2	2.4
1	Junction Box JB-29-A		1600-291955400 R16-B-10216-115 2Z5652-29A	8-15/32	4-1/8	2-7/16	
1	Jack Box BC-629A		1600-212970000 R16-AYS-BC-629A 2C2229A/K1	4-27/64	2-29/64	1-61/64	0.6
1	Jack Box BC-630A		1600-212982000 R16-AYS-BC-630A 2C2230A	6-27/64	2-29/64	1-61/64	0.6
1	Jack Box BC-631A		1600-212986000	4-1/16	2-29/64	1-61/64	0.52
8	Crystal Unit						
7	Cords			60 long			6.89
1	"T" Junction Box Assembly						3.8
1	Set of Tools						0.85
2	Socket			1-9/16	1-9/16	51/64	1.16
2	Plug						

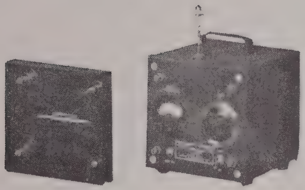
TEST EQUIPMENT IE-19-A
(TEST SET, RADIO, IE-19-A)

SIGNAL GENERATOR I-130-A

CORD CD-477

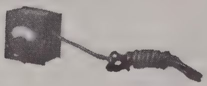


CHEST CH-93-A



FIELD STRENGTH METER I-95-A.

TEST SET
I-139-A



FUNCTIONAL DESCRIPTION:

A combination test set used for bench and field testing of airborne communications equipment. It provides the necessary signals and measuring devices to properly align and test transmitter and receiver units. For detailed information regarding calibration, etc. of the various component units of this test set refer to the data sheets prepared for the individual component units.

RELATIONSHIP TO OTHER EQUIPMENT:

Used with airborne communications equipment such as SCR-522, SCR-542, etc.

ELECTROMECHANICAL DESCRIPTION:

Circuit Information: Consists of I-130-A Signal Generator; I-139-A, 0 to 1 milliammeter; and I-95-A Field Strength Meter. For detailed circuit data, etc., refer to data sheet for the particular equipment.

(Continued)

	AIR FORCE	NAVY	ARMY
TYPE CLASS.	Standard		
STOCK NOS.	1690-327131990	ASO-R16-T-1825	3F3929A
PROCUREM'T INFO.: SCC Dwg. No. 6298; SCD Dwg. No. 10169			
PROCUREM'T COG.: USAF		DESIGN COG.: USAF, C&N	
F.I.I.N.:		FUNCTIONAL CLASS. NO.: 10. 1.9	
- Electronics Test Equipment -			IE-19-A

This project was supported by the USAF on Contract AF 33(600)28276 and monitored by WADC, ARDC - Carl L. Frederick, Bethesda, Md. - Multilithed in U. S. A.

TEST EQUIPMENT IE-19-A
(TEST SET, RADIO, IE-19-A)

ELECTROMECHANICAL DESCRIPTION: (Continued)

Power Supply: I-130-A: 135 volts supplied by six Batteries BA-2 (22.5 volts), and 6 volts supplied by four Batteries BA-23 (1.5 volts). I-95-A: 45 volts supplied by two Batteries BA-2 (22.5 volts), and 1.5 volts supplied by one Battery BA-23 (1.5 volts).
Frequency Range: 100 to 156 megacycles per second, signal generator.
Modulation Frequency: 1000 cycles per second.
Output Voltage: 0 to 5000 microvolts, uncalibrated.
Field Strength Meter: 0 to 1 milliamperes.

MANUFACTURERS' OR CONTRACTORS' DATA:

Rauland Corporation, Order No. 12014-WF-43; Approximate Cost per Equipment, $301.15.

TUBE COMPLEMENT:

2 JAN-9002, 3 JAN-9003, 1 JAN-1S5.

REFERENCE DATA AND LITERATURE:

TO 16-10-111 (Instruction Book).
TO 16-40IE-1 (Modification of Field Strength Meter).
TO 16-55-262 (Spare Parts List).

SHIPPING DATA:

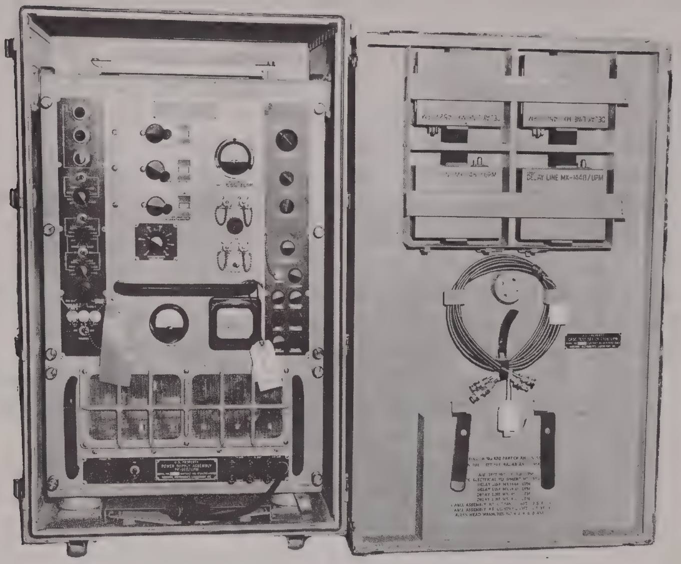
No. of Boxes	Contents & Identification	Volume (Cu. Ft.)	Over-all Dimensions (inches)			Weight Packed (Lbs.)
			H	W	D	

TEST EQUIPMENT IE-19-A
(TEST SET, RADIO, IE-19-A)

EQUIPMENT SUPPLIED:

Quant. Per Eq'pt	Name and Nomenclature	Case Mat'l	Stock Numbers (USAF) (Navy) (Army)	Over-all Dimensions (inches)			Weight (Lbs.)
				H	W	D	
1	Signal Generator I-130-A	Metal	1690-327002000 3F3900-130-A	19	9-3/4	7-9/16	27.2
1	Battery Box BX-33-A		7CBR-BX-33 R16-AYS-BX-33-A 3B333A	9-3/8	8-1/2	8-11/16	9.5
1	Test Set I-139-A		7CAC-028680 3F4139A				1.1
1	Field Strength Meter I-95-A		1690-326190000 R16-AYS-I-95-A 3F2725A	8-1/2	7-5/16	7-1/4	11.0
1	Chest CH-93-A	Wood	1690-287058500 R16-AYS-CH-93A 2Z2593A	19-1/2	22-3/4	11	48.5
1	Tool Set, Special						3.8
1	Cord CD-477		1600-321390510	60 long			

RADAR TEST SET AN/UPM-41



FUNCTIONAL DESCRIPTION:

A portable, general purpose test set which provides means for evaluating the performance of the intermediate frequency and video sections of limiting and lin-log types of moving target indicator systems. The test set includes a signal generator and a pulse jitter tester housed in one cabinet with a common, self-contained power supply. The pulse jitter tester measures the time jitter of intermediate frequency and video pulses. The signal generator can be used in measuring subclutter visibility, video cancellation ratio, and coherent oscillator stability. The signal generator also can be used to investigate the shape of the phase detector characteristic.

RELATIONSHIP TO OTHER EQUIPMENT:

AN/UPM-41 is the overall nomenclature for Indicator Test Set TS-677/UP.

ELECTROMECHANICAL DESCRIPTION:

Power Supply: 115 volts ±10%, AC, 50 to 1000 cycles per second, single phase, 550 watts.

(Continued)

	AIR FORCE	NAVY	ARMY
TYPE CLASS.	Substitute Standard		
STOCK NOS.	7CAC-801319-2232		
PROCUREM'T INFO.:	USAF Exhibit MCREE-940 dated 16 February 1951		
PROCUREM'T COG.:	USAF	DESIGN COG.:	USAF, Rome
F.I.I.N.:		FUNCTIONAL CLASS. NO.:	10.1.10
	- Electronics Test Equipment -		AN/UPM-41

This project was supported by the USAF on Contract AF 33(600)28276 and monitored by WADC, ARDC - Carl L. Frederick, Bethesda, Md. - Multilithed in U. S. A.

RADAR TEST SET AN/UPM-41

ELECTROMECHANICAL DESCRIPTION: (Continued)

Signal Generator:

Frequency Range: 27 to 33 megacycles per second (continuously variable).

Power Output: 1 milliwatt.

Voltage Output: 22.4 microvolts to 224 millivolts, calibrated.

Output Impedance: 50 ohms.

Accuracy: ±0.1 megacycle for frequency calibration.
±10% of indicated internal pulse repetition rate.
±10% of one milliwatt.
±0.5 decibels for output attenuator.
±10% of indicated pulse delay.
±5% of indicated target speed.

Oscillator Stability: Drifts less than ±0.01% of indicated frequency for one minute after 15 minutes warmup period.

Type of Transmission: Pulsed Carrier and Continuous Wave.

Video Trigger: The evaluator can be triggered externally or internally. The internal trigger pulse triggers the evaluator and at the same time provides a source of trigger pulses to the front panel.

External Trigger: Pulse Width: 0.18 to 10 microseconds.
Pulse Repetition Rate: 50 to 6000 pulses per second.
Pulse Amplitude: 15 to 50 volts.
Pulse Polarity: Positive or Negative.

Internal Trigger: Pulse Width: 1 microsecond.
Pulse Repetition Rate: 50 to 6000 pulses per second.
Pulse Amplitude: 15 volts.

IF Coherent Oscillator Synchronizing Pulse: A synchronizing pulse at IF occurring at the same time as the trigger, and serving to simulate the COHO synchronizing pulse normally provided to an MTI receiver. This pulse establishes a phase reference for the coherent oscillator.

Pulse Width: 0.2, 0.5, 1, 2, or 3 microseconds.
Pulse Rise Time: Less than 0.2 microseconds.
Pulse Delay Time: 6 to 540 microseconds.

Fixed Target Pulse: An IF pulse simulates a fixed target. It has a manually variable delay with respect to the synchronizing pulse, but it has a constant phase for any given delay setting relative to the IF within the synchronizing pulse envelope.

Pulse Width: 0.6, 1.5, 3, 6, or 8 microseconds.
Pulse Rise Time: Less than 0.2 microseconds.
Pulse Delay Time: 6 to 540 microseconds (1.5 to 45 nautical miles).

Moving Target Pulse: An IF pulse to simulate a moving target. It has a manually variable delay with respect to the synchronizing pulse, and a manually adjustable control to set the rate of change of phase relative to the IF in the synchronizing pulse. This makes it possible to simulate any desired radial component of target velocity. The time delay and phase rate adjustments are independent of each other.

(Continued)

ELECTROMECHANICAL DESCRIPTION: (Continued)

Rate of Change of Phase (Relative to COHO locking pulse):

50 to 10,000 cycles per second frequency difference, simulate any radial target velocity up to 3000 knots per kilomegacycle.

Attenuator: 0 to 80 decibels.

CW Source: A source of continuous wave of fixed phase relative to the IF in the synchronizing pulse for use in observing phase detector characteristics and coherent oscillator stability. It is provided through the same signal jack that supplies the fixed and moving target pulses. By switching, the continuous wave IF signal will be fed through this jack instead of the fixed and moving target pulses.

Jitter Tester:

Oscilloscope (three-inch): Provides a means for measuring the pulse jitter or instability of the pulse repetition rate of MTI pulses.

Spread: 0.01 microseconds corresponds to about 0.012 inches on the oscilloscope.

Sweep Frequency Range: 258 kilocycle sine wave.

Trace: Intensified for 15 microseconds starting 0.1 microseconds before pulse begins.

Full Deflection: Produced by 2 millivolts or more.

Peak and Background Brightness: Manually adjustable.

Observed Pulse: Either the system trigger (video signal) or the IF coherent oscillator locking pulse furnished by the system.

Frequency Range: 27 to 33 megacycles per second.

Impedance: 75 ohms.

Pulse Jitter Accuracy: ±10% but not less than ±0.01 microseconds.

MANUFACTURERS' OR CONTRACTORS' DATA:

Airborne Instrument Laboratory, Inc., 160 Old Country Road, Mineola, New York; USAF Contract AF 33(038)30064 dated 23 June 1951; Approximate Cost per Unit, $2000.00. AIL Part/Dwg. No. 2220-1.

TUBE COMPLEMENT:

1 JAN-OB2, 4 JAN-5R4WGY, 3 JAN-6AS7G, 4 JAN-6AU6, 1 JAN-6X4W, 13 JAN-12AT7, 5 JAN-5750, 3 JAN-5726, 6 JAN-6D4, 2 JAN-5725, 16 JAN-5654, 2 JAN-6AG7, 3 JAN-6005, 1 JAN-6C4, 1 JAN-3JP11.

REFERENCE DATA AND LITERATURE:

AN 16-35TS677-1 (Operating Instructions).
AN 16-35TS677-2 (Service Instructions).
AN 16-35TS677-3 (Overhaul Instructions).
AN 16-35TS677-4 (Illustrated Parts Breakdown).

SHIPPING DATA:

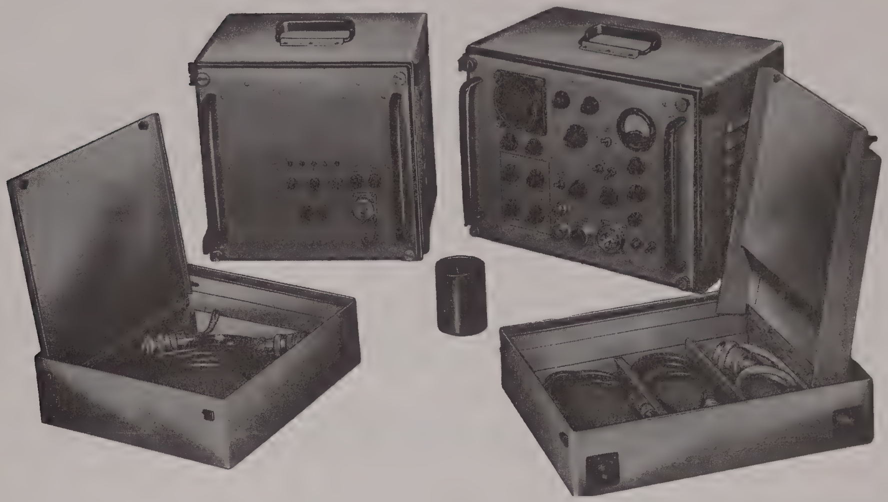
No. of Boxes	Contents & Identification	Volume (Cu. Ft.)	Over-all Dimensions (inches)			Weight Packed (Lbs.)
			H	W	D	

RADAR TEST SET AN/UPM-41

EQUIPMENT SUPPLIED:

Quant. Per Eq'pt	Name and Nomenclature	Case Mat'l	Stock Numbers (USAF) (Navy) (Army)	Over-all Dimensions (inches)			Weight (Lbs.)
				H	W	D	
1	Radar Test Set AN/UPM-41 Including:	Aluminum	7CAC-801319-2232	33-7/16	21-3/8	20-5/8	
1	Test Set Case CY-1318/UPM			33-7/16	21-3/8	20-5/8	97
1	Electrical Equipment Rack MT-1197/UPM			29-1/2	17-1/8	19	28
1	Indicator Test Set TS-677/UP TS-677/UP		3F4325-677	29-1/2	17-1/8	19	60
1	Power Supply Assembly PP-910/UPM			8-3/16	17-3/8	19	88
1	RF Cable Assembly CG-579/U		1800-322981627 3E6015-579.3	36 long			1/8
3	RF Cable Assembly CG-546/U		7CAC-170265-217 3E6015-546.3	72 long			15/16
1	Delay Line MX-1448/UP			5-3/8	2	6	15/16
1	Delay Line MX-1449/UP			5-3/8	2	6	1-1/16
1	Delay Line MX-1450/UP			5-3/8	2	6	1-1/8
1	Delay Line MX-1451/UP			5-3/8	2	6	1-5/16
1	Delay Line MX-1452/UP			5-3/8	2	6	1-7/16

TEST SET, RADAR AN/UPM-66



FUNCTIONAL DESCRIPTION:

A portable, special purpose test set used for preflight and bench checking of Radar Set AN/APS-27. The equipment is designed to check the ability of the radar set to distinguish between fixed and moving targets and, in the case of substandard performance, to determine which component of the radar set is at fault.

RELATIONSHIP TO OTHER EQUIPMENT:

ELECTROMECHANICAL DESCRIPTION:

Circuit Information: The transmitted pulse from the radar set is coupled into the Test Set TS-898/UPM-66 from the directional coupler, mixed with a signal from the local oscillator in the balanced mixer, and fed into a 60-megacycle IF amplifier. The output of the IF amplifier is fed through a fused quartz delay line into a second IF amplifier where modulation may be applied to the pulse at a frequency of 1/2 the radar set PRF. (The presence and amplitude of modulation is controllable from the front panel.) The pulse is then returned, at a level determined by the setting of the test set IF GAIN and ATTN controls, to the radar set IF where it simulates a moving target return. The video output of the radar set is fed to the input of the test set synchroscope where it appears as an "A" scan presentation. The ability of the radar set to cancel fixed targets is measured by comparing the video residue from a fixed target with the video output of a moving target.

(Continued)

	AIR FORCE	NAVY	ARMY
TYPE CLASS.			
STOCK NOS.	7CAC-801319-2395		
PROCUREM'T INFO.:	Contractor Prepared Spec: MIL-T-945 Requirements		
PROCUREM'T COG.:	USAF	DESIGN COG.:	USAF, WADC, ARL
F.I.I.N.:		FUNCTIONAL CLASS. NO.:	10.1.10
	- Electronics Test Equipment -		AN/UPM-66

This project was supported by the USAF on Contract AF 33(600)28276 and monitored by WADC, ARDC - Carl L. Frederick, Bethesda, Md. - Multilithed in U.S.A.

TEST SET, RADAR AN/UPM-66

ELECTROMECHANICAL DESCRIPTION: (Continued)

This ability is called Subclutter Visibility and is checked for the radar set, the radar set without the effect of magnetron frequency instability, and for the radar set comparator alone. For the latter check a video pulse is supplied directly to the comparator from the pulse generator in the test set and the RF and IF sections of the test set are not utilized. The built-in synchroscope has three sweep lengths, a variable delay, and an internal voltage calibrator. DC operating voltages are supplied by a separate Power Supply PP-1295/UPM-66, and may be checked by means of a meter mounted on the test set front panel. In addition the meter may be used to check mixer crystal currents and klystron repeller voltage.

Power Supply: 115 volts ±10%, AC, 380 to 1,000 cycles per second, single-phase, 350 watts.

Frequency Range: Pulsed RF signals: 9375 ±40 megacycles with 2,000 pulses per second repetition rate. IF Pulses: 60 megacycles delayed 8.6 microseconds.

Pulse Generator: Delayed Pulse: 0.4 microsecond delayed 6 microseconds. Undelayed Pulse: 5 microseconds.

Power Supply Output: -175 volts, DC, 50 milliamperes; +300 volts, DC, 116 milliamperes; +150 volts, DC, 105 milliamperes; +6 volts, DC, 440 milliamperes.

Connectors: Type N.

Input Impedance: 50 ohms.

Variable Attenuation for Accepting Signals: 27 decibels to 40 decibels below 55 kilowatts.

System Subclutter Visibility: 12 to 40 decibels ± 1 decibel.

Receiver Subclutter Visibility: 12 to 40 decibels ± 1 decibel.

Comparator Subclutter Visibility: 12 to 40 decibels ± 1 decibel.

Synchroscope: Sweep Delay: 3 to 13 microseconds. Sweep Speeds: 3, 12, and 150 microseconds.

MANUFACTURERS' OR CONTRACTORS' DATA:

Manufacturer: Laboratory for Electronics, Incorporated, 75 Pitts Street, Boston 14, Massachusetts. Contractor: Motorola, Incorporated, Chicago, Illinois; Contract No. AF 33(600)26144.

TUBE COMPLEMENT:

PP-1295/UPM-66: 4 JAN-5727/2D21W, 3 JAN-6080WA, 3 JAN-6AH6, 1 JAN-OA2, 2 JAN-12AT7WA, 1 JAN-6X4W, 1 JAN-5687, 1 JAN-5651.

TS-898/UPM-66: 10 JAN-12AT7WA, 1 JAN-6AU6WA, 4 JAN-6AK5/5654/6096, 2 JAN-6AH6, 2 JAN-5725/6AS6W, 2 JAN-5687, 1 JAN-5727/2D21W, 3 JAN-5726/6AL5W/6097, 2 JAN-5751WA, 3 JAN-5814WA, 1 JAN-1Z2, 1 JAN-3RP1, 1 JAN-

SHIPPING DATA:

No. of Boxes	Contents & Identification	Volume (Cu. Ft.)	Overall Dimensions (inches)			Weight Packed (Lbs.)
			H	W	D	
1	Test Set TS-898/UPM-66	3.2	16	19-1/2	17-1/2	70
1	Power Supply PP-1295/UPM-66	2.8	16	16-1/2	18-1/2	63

TEST SET, RADAR AN/UPM-66

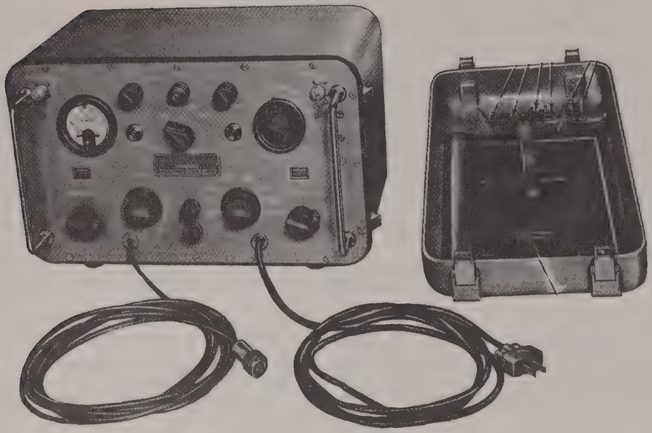
TUBE COMPLEMENT: (Continued)
2K25, 2 JAN-1N23B, 2 JAN-1N126.

REFERENCE DATA AND LITERATURE:

EQUIPMENT SUPPLIED:

Quant. Per Eq'pt	Name and Nomenclature	Case Mat'l	Stock Numbers (USAF) (Navy) (Army)	Overall Dimensions (inches) H	W	D	Weight (Lbs.)
1	Test Set, Radar AN/UPM-66		7CAC-801319-2395				
	Including:						
1	Power Supply PP-1295/UPM-66		7CAC-652755	14-1/2	14-3/4	15	48
1	Test Set, Radar TS-898/UPM-66	Aluminum	7CAC-801319-239	14	18	15-1/4	55

RADAR SIGNAL SIMULATOR SM-65/UP



FUNCTIONAL DESCRIPTION:

A portable, special purpose equipment used to measure the overall relative performance of MTI equipped radars. This simulator samples and attenuates the radar transmitted pulse, converting it to an intermediate frequency which is transmitted through a closed-loop circuit to generate simulated target signals. The target signals, which can be doppler-modulated to simulate moving targets, are returned to the radar at radio frequencies and are shown as fixed targets, moving targets, or moving targets in clutter areas. By doppler modulation of the simulated fixed targets, the simulator supplies a variable ratio of moving target to fixed target components. This ratio is calibrated in terms of decibel sub-clutter visibility. The instrument may also be used to check the accuracy of the radar range markers, provide a power level comparison indicator, tune the radar, provide a detector circuit from which the radar transmitted pulse shape can be monitored, and as a signal generator.

	AIR FORCE	NAVY	ARMY
TYPE CLASS.			
STOCK NOS.			
PROCUREM'T INFO.: Spec. No. MIL-S-15293 (Ships)			
PROCUREM'T COG.: Navy	DESIGN COG.: Navy, BuShips		
F.I.I.N.:	FUNCTIONAL CLASS. NO.: 10.1.10		
- Electronics Test Equipment -			SM-65/UP

This project was supported by the USAF on Contract AF 33(600)28276 and monitored by WADC, ARDC - Carl L. Frederick, Bethesda, Md. - Multilithed in U. S. A.

RADAR SIGNAL SIMULATOR SM-65/UP

RELATIONSHIP TO OTHER EQUIPMENT:

ELECTROMECHANICAL DESCRIPTION:

Circuit Information: The simulator includes an RF head, IF circuits, and tuning circuits. The RF head consists of a balanced mixer, a stable local oscillator (Stalo), and a crystal mixer. The IF circuits consist of a variable phase shifter, doppler modulator, IF amplifier, quartz delay cell, piston attenuator, and cathode follower. The timing circuits include a pulse amplifier, two multivibrators, and one flip-flop trigger which provide the IF gating and bias variation (pulsing) for the doppler modulator. An electronically regulated power supply provides 175 volts, DC, for plate and screen grid circuits, remaining constant with a ±10% variation of AC voltage.

Power Supply: 105 to 125 volts, AC, single phase, 50 to 1000 cycles per second, 75 watts.

Frequency Range: Radar operation of 1215 to 1355 megacycles per second and as a signal generator, 1197.5 to 1337.5 megacycles per second.

Pulse Repetition Rate: 60 to 12000 pulses per second (determined by radar system under test).

Intermediate Frequency: 17.5 megacycles per second.

Bandwidth of Simulator IF: 2 to 2.5 megacycles per second.

Signal Level: 55 decibels above radar receiver noise level (based on maximum directional coupler loss of 33 decibels).

MANUFACTURERS' OR CONTRACTORS' DATA:

Pitometer Log Corporation, 237 Lafayette Street, New York, New York; Contract Nos. NObsr-57213 and NObsr-57560, 20 June 1952.

TUBE COMPLEMENT:

5 JAN-12AT7WA, 2 JAN-5654, 1 JAN-5725, 1 JAN-2C43, 2 JAN-6173, 1 JAN-6L6W6B/5881, 2 JAN-6X4W, 1 JAN-5651, 1 JAN-5751.

REFERENCE DATA AND LITERATURE:

NAVSHIPS 92050 (Instruction Book).

RADAR SIGNAL SIMULATOR SM-65/UP

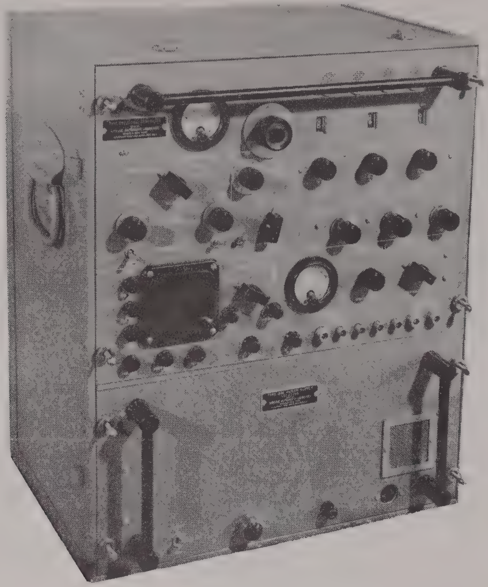
SHIPPING DATA:

No. of Boxes	Contents & Identification	Volume (Cu. Ft.)	Overall Dimensions (inches)			Weight Packed (Lbs.)
			H	W	D	
1	Radar Signal Simulator SM-65/UP	6.75	22	26-1/2	20	65
1	Spare Parts	1.57	11-1/2	22-1/2	10-1/2	47

EQUIPMENT SUPPLIED:

Quant. Per Eq'pt	Name and Nomenclature	Case Mat'l	Stock Numbers (USAF) (Navy) (Army)	Overall Dimensions (inches)			Weight (Lbs.)
				H	W	D	
1	Radar Signal Simulator SM-65/UP			14-29/32	16-3/4	9-5/16	42

MOVING TARGET INDICATOR EVALUATOR SET TS-677(XW)/UP



FUNCTIONAL DESCRIPTION:

A moving target indicator evaluator used to determine the sub-clutter visibility and pulse jitter of moving target indicator radar systems. Sub-clutter is determined by an IF signal generator which provides calibrated fixed and moving target signals. The evaluator when used in conjunction with Stalo Stability Tester TS-697(XW)/U checks operational efficiency, sensitivity and overall performance of MTI systems operating in L, S, and X bands. All operating controls are located on the front panel of the instrument.

RELATIONSHIP TO OTHER EQUIPMENT:

Overall nomenclature is Radar Test Set AN/UPM-41.

ELECTROMECHANICAL DESCRIPTION:

Circuit Information: Includes a signal generator and pulse jitter tester housed in one cabinet with a common, self-contained power supply. The signal generator produces two output signals.

(Continued)

	AIR FORCE	NAVY	ARMY
TYPE CLASS.	Experimental		
STOCK NOS.			
PROCUREM'T INFO.: Dwg. No. 1583; Exhibit WLENG-1083B			
PROCUREM'T COG.: USAF		DESIGN COG.: USAF, Rome	
F.I.I.N.:		FUNCTIONAL CLASS. NO.: 10.1.10	
	- Electronics Test Equipment -		TS-677(XW)/UP

This project was supported by the USAF on Contract AF 33(600)28276 and monitored by WADC, ARDC - Carl L. Frederick, Bethesda, Md. - Multilithed in U. S. A.

MOVING TARGET INDICATOR EVALUATOR SET TS-677(XW)/UP

ELECTROMECHANICAL DESCRIPTION: (Continued)

Power Supply: 115 volts, AC, single phase, 50 to 1600 cycles per second, 550 watts.

Signal Generator:

Frequency Range: 27 to 33 megacycles per second (continuously variable).

Power Output: 1 milliwatt.

Output Impedance: 50 ohms.

Accuracy: ±0.1 megacycle for frequency calibration.
±10% of indicated internal pulse repetition rate.
±10% of one milliwatt.
±0.5 decibels for output attenuator.
±10% of indicated pulse delay.
±5% of indicated target speed.

Oscillator Stability: ±0.01% of indicated frequency.

Type of Transmission: Pulsed Carrier.

Video Trigger: The evaluator can be triggered externally or internally. The internal trigger pulse triggers the evaluator and at the same time provides a source of trigger pulses to the front panel.

External Trigger: Pulse Width - 0.08 to 10 microseconds.
Pulse Repetition Rate - 50 to 6000 pulses per second.
Pulse Amplitude - 15 to 50 volts.
Pulse Polarity - positive or negative.

Internal Trigger: Pulse Width - 1 microsecond.
Pulse Repetition Rate - 50 to 6000 pulses per second.
Pulse Amplitude - 25 volts.

IF Coherent Oscillator Synchronizing Pulse: A synchronizing pulse at IF occurring at the same time as the trigger and serving to simulate the COHO synchronizing pulse normally provided to an MTI Receiver. This pulse establishes a phase reference for the coherent oscillator.

Fixed Target Pulse: An IF pulse to simulate a fixed target having a manually variable delay with respect to the synchronizing pulse but with a constant phase for any given delay setting relative to the IF within the synchronizing pulse envelope.

Pulse Width: 8 microseconds.

Pulse Rise Time: Less than 0.2 microseconds.

Pulse Delay Time: 6 to 540 microseconds (0.5 to 45 nautical miles).

Moving Target Pulse: An IF to simulate a moving target having a manually variable delay with respect to the synchronizing pulse and a manually adjustable control to set the rate of change of phase relative to the IF in the synchronizing pulse in order to simulate any desired radial component of target velocity. The time delay and phase rate adjustments are independent of each other.

Pulse Width: 2 microseconds.

Pulse Rise Time: Less than 0.2 microseconds.

Pulse Delay Time: 6 to 540 microseconds (0.5 to 45 nautical miles).

Rate of Change of Phase: Relative to COHO locking.

(Continued)

MOVING TARGET INDICATOR EVALUATOR SET TS-677(XW)/UP

ELECTROMECHANICAL DESCRIPTION: (Continued)

Pulse: 50 to 10,000 cycles per second frequency difference, simulate any radial target velocity up to 3000 knots per kilomegacycle.

Attenuator: 0 to 80 decibels.

CW Source: A source of CW of fixed phase relative to the IF in the synchronizing pulse for use in observing phase detector characteristics and coherent oscillator stability, is provided through the same signal jack that supplies the fixed and moving target pulses. By switching the CW, the IF signal will be fed through this jack instead of the fixed and moving target pulses.

Jitter Tester:

Three Inch Oscilloscope: Provides a means for measuring the pulse jitter or instability of the pulse repetition rate of MTI pulses.

Spread: 0.01 microseconds corresponds to about 0.025 inches on the oscilloscope.

Sweep: 262 to 268 kilocycle sine wave.

Trace: Intensified for 15 microseconds starting 0.1 microseconds before pulse begins.

Peak and Background Brightness: Manually adjustable.

Observed Pulse: Either the system trigger (video signal) or the IF coherent oscillator locking pulse furnished by the system.

Accuracy: ±0.01 microseconds pulse jitter.

MANUFACTURERS' OR CONTRACTORS' DATA:

Airborne Instrument Laboratory, Incorporated, 160 Old Country Road, Mineola, New York; Contract No. W-28-099-ac-463.

TUBE COMPLEMENT:

1 JAN-OB2, 1 JAN-6AS6, 1 JAN-2C51, 1 JAN-6AS7, 1 JAN-3JP1, 1 JAN-6AV6, 1 JAN-5R499, 1 JAN-6BE6, 1 JAN-6AG7, 1 JAN-6DX, 1 JAN-6AL5, 1 JAN-6J6, 1 JAN-AG5, 1 JAN-6X5, 1 JAN-6AK5.

REFERENCE DATA AND LITERATURE:

SHIPPING DATA:

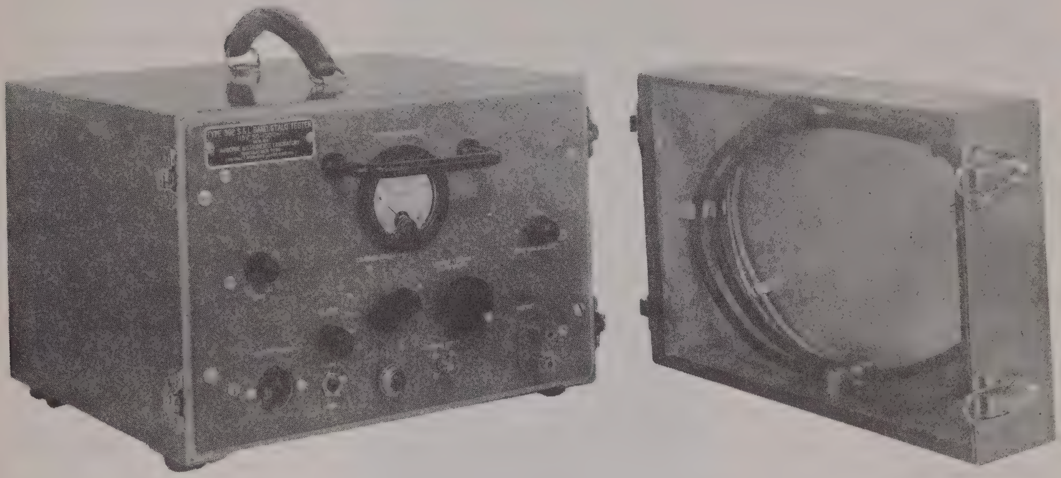
No. of Boxes	Contents & Identification	Volume (Cu. Ft.)	Over-all Dimensions (inches)			Weight Packed (Lbs.)
			H	W	D	

MOVING TARGET INDICATOR EVALUATOR SET TS-677(XW)/UP

EQUIPMENT SUPPLIED:

Quant. Per Eq'pt	Name and Nomenclature	Case Mat'l	Stock Numbers (USAF) (Navy) (Army)	Over-all Dimensions (inches)			Weight (Lbs.)
				H	W	D	
1	Signal Generator and Jitter Tester			24	19-7/8	17-7/8	160
1	Power Cord						
2	Cables with Type N Plug			72 long			
2	Cables with Type BNC Plug			72 long			
2	Instruction Book						
1	Tube-Pin Straightener						
1	Socket Straightener						
1	Tube Puller						
1	Set Alignment Tools						

STALO STABILITY TESTER TS-697/U



FUNCTIONAL DESCRIPTION:

A stability tester used to observe the frequency stability of radar stalos. This equipment provides a very precise means for studying the short-time stability of a microwave oscillator. It measures the frequency characteristics of MTI Stalos by determining the optimum sub-clutter visibility obtainable at a given range with a stalo due to the frequency drift and the frequency jitter. Peak to peak frequency variation can be measured and approximate rate of jitter determined from this data.

RELATIONSHIP TO OTHER EQUIPMENT:

ELECTROMECHANICAL DESCRIPTION:

Circuit Information: Provides a series of highly stable internally generated frequencies which are heterodyned with the signal from the stalo under test, and when the oscillator frequency is properly set a 30 megacycle per second beat signal is produced in the mixer. This signal then beats against a 30 megacycle

(Continued)

	AIR FORCE	NAVY	ARMY
TYPE CLASS.	Development		
STOCK NOS.			3F4325-697
PROCUREM'T INFO.: Exhibit MCREE-924			
PROCUREM'T COG.: USAF		DESIGN COG.: USAF, Rome	
F.I.I.N.:		FUNCTIONAL CLASS. NO.: 10.1.10	
- Electronics Test Equipment -			TS-697/U

This project was supported by the USAF on Contract AF 33(600)28276 and monitored by WADC, ARDC - Carl L. Frederick, Bethesda, Md. - Multilithed in U.S.A.

STALO STABILITY TESTER TS-697/U

ELECTROMECHANICAL DESCRIPTION: (Continued)

per second signal that is derived from a 10 megacycle per second crystal oscillator, and produces an audio frequency signal. Since the AF signal varies in frequency by the same number of cycles per second as the stalo under test, this signal can be used to measure jitter and drift.

Power Supply: 115 volts, AC, single phase, 50 to 1000 cycles per second, 60 watts.
Frequency Range: 1120 to 1700 megacycles per second.
2600 to 3200 megacycles per second.
Power Input: 10 microwatts.
Input Impedance: 70 ohms.
Audio Output: 20 volts (rms) maximum.
Output Impedance: 2000 ohms.
Temperature Range: -40° C. to +55° C.

MANUFACTURERS' OR CONTRACTORS' DATA:

Airborne Instruments Laboratory, Inc., 160 Old Country Road, Mineola, New York, Contract No. W-28-099-ac-463; Approximate Cost per Unit, $1800.00.

TUBE COMPLEMENT:

1 JAN-OB2, 1 JAN-6C4, 1 JAN-6AT6, 1 JAN-6AV6, 1 JAN-6AG5, 1 JAN-6X4, 1 JAN-6AK5, 1 JAN-6S6.

REFERENCE DATA AND LITERATURE:

Handbook of Maintenance Instructions, Airborne Instruments Laboratory, Inc., December 1950 - Report 556-H-1.

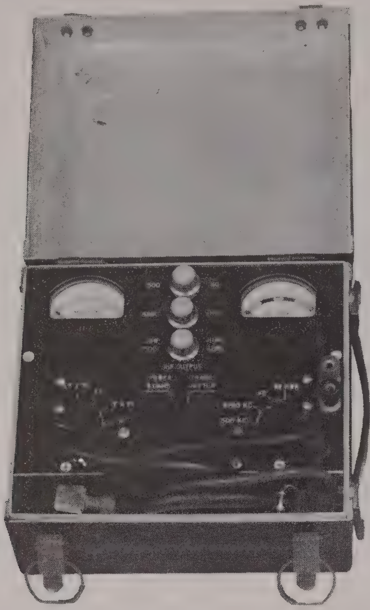
SHIPPING DATA:

No. of Boxes	Contents & Identification	Volume (Cu. Ft.)	Overall Dimensions (inches)			Weight Packed (Lbs.)
			H	W	D	

EQUIPMENT SUPPLIED:

Quant. Per Eq'pt	Name and Nomenclature	Case Mat'l	Stock Numbers (USAF) (Navy) (Army)	Overall Dimensions (inches)			Weight (Lbs.)
				H	W	D	
1	Stalo Stability Tester TS-697/U		3F4325-697	9	14-1/2	12-1/4	20
1	Power Cord			120 long			
1	Cable			72 long			

TEST SET TS-522/CRT-3
(TEST SET, RADIO, TS-522/CRT-3)



FUNCTIONAL DESCRIPTION:

A portable, special purpose and self-contained test set designed to check the performance of and maintain radio transmitters.

Provision is made to measure the transmitter plate and filament voltages and currents, to check the functioning of the automatic keying and frequency changing cams, to determine the presence of modulation on 500 kilocycles per second transmission, to determine the radio-frequency power output on 500 and 8280 kilocycles per second, and to check the transmitter power supply.

RELATIONSHIP TO OTHER EQUIPMENT:

Equipment required but not supplied: High impedance headphone set with a Plug, PL-55.

TS-522/CRT-3 will be replaced by Analyzer TS-625/URQ.

	AIR FORCE	NAVY	ARMY
TYPE CLASS.	Standard		
STOCK NOS.	7CAC-801319-24		3F4325-522
PROCUREM'T INFO.: USAF Spec. No. 71-5056-A			
PROCUREM'T COG.: USAF		DESIGN COG.: USAF, C&N	
F.I.I.N.:		FUNCTIONAL CLASS. NO.: 10.1.11	
- Electronics Test Equipment -			TS-522/CRT-3

This project was supported by the USAF on Contract AF 33(600)28276 and monitored by WADC, ARDC - Carl L. Frederick, Bethesda, Md. - Multilithed in U. S. A.

TEST SET TS-522/CRT-3
(TEST SET, RADIO, TS-522/CRT-3)

ELECTROMECHANICAL DESCRIPTION:

Power Supply: From equipment under test or external power supply consisting of one 24 volt DC, 0.3 amperes approximately, and one 320 volt DC, 0.04 amperes, approximately, source.

MANUFACTURERS' OR CONTRACTORS' DATA:

Nilsson Electrical Laboratory, 103 Lafayette Street, New York, New York; Approximate Cost per Unit, $102.00, 3 May 1953.

John Meck Industries, Liberty and Pennsylvania, Plymouth, Indiana.

TUBE COMPLEMENT:

None.

REFERENCE DATA AND LITERATURE:

TO 16-35TS522-3 (Maintenance Instructions).
TO 16-35TS522-4 (Parts Catalog).
TO 16-55-419 (Spare Parts List).

SHIPPING DATA:

No. of Boxes	Contents & Identification	Volume (Cu. Ft.)	Overall Dimensions (inches)			Weight Packed (Lbs.)
			H	W	D	
1	Test Set with accessories, TS-522/CRT-3 (Packed in a Nailed, Wooden Box)	0.32	11	5	10	8

EQUIPMENT SUPPLIED:

Quant. Per Eq'pt	Name and Nomenclature	Case Mat'l	Stock Numbers (USAF) (Navy) (Army)	Overall Dimensions (inches)			Weight (Lbs.)
				H	W	D	
1	Test Set TS-522/CRT-3 (less accessories)	Aluminum	7CAC-801319-24 3F4325-522	9	3-7/8	8-3/4	5.5
1	External Power Supply Adapter U-76/CRT-3			5-1/4	2	1-3/8	0.25
2	DC Cables equipped with Jones Plugs						
1	Antenna Adapter Cable						
1	Instruction Book						

POWER TEST SET TS-627/U

FUNCTIONAL DESCRIPTION:

A portable, general purpose equipment designed to analyze industrial loads by measuring AC current, voltage, and power in 25 to 125 cycles per second, single-phase and polyphase circuits. The analyzer also measures power factor in 3-phase, 3-wire circuits. The analyzer may be used for general testing or installation work. Test results are presented on panel-mounted meters.

RELATIONSHIP TO OTHER EQUIPMENT:

The TS-627/U is similar to the Industrial Analyzer Westinghouse Type TA and the Power Analyzer Weston 639 Type 2.

ELECTROMECHANICAL DESCRIPTION:

Circuit Information: The test set consists essentially of a voltmeter, a wattmeter, a power factor meter, and an ammeter. All meters have 3.5-inch scales. A chart showing the proper wattmeter scale multiplying factor for each current and voltage range is permanently affixed to the panel of the analyzer.

(Continued)

	AIR FORCE	NAVY	ARMY
TYPE CLASS.			
STOCK NOS.			
PROCUREM'T INFO.:			
PROCUREM'T COG.: Navy		DESIGN COG.: Navy	
F.I.I.N.:		FUNCTIONAL CLASS. NO.: 10.1.11	
- Electronics Test Equipment -			TS-627/U

POWER TEST SET TS-627/U

ELECTROMECHANICAL DESCRIPTION: (Continued)

Power Supply: None

Alternating Voltage Range: 0 to 150, 0 to 300, 0 to 600 volts; accuracy ±1%.

Power Range: (KILOWATTS POLYPHASE): 0 to 1.0 (multiplied by factor 1, 2, 4, 5, 10, 20, 25, 50, or 100 as applicable); accuracy ±2%.

POWER FACTOR Range (Three-Phase): 0.30 lagging to 0.80 leading; accuracy ±1%.

Alternating Current Range: 0 to 5, 0 to 25, 0 to 125 amps, accuracy ±1%.

MANUFACTURERS' OR CONTRACTORS' DATA:

Weston Electrical Instrument Corporation, Newark 5, New Jersey.

TUBE COMPLEMENT:

None

REFERENCE DATA AND LITERATURE:

Manufacturer's Catalog.

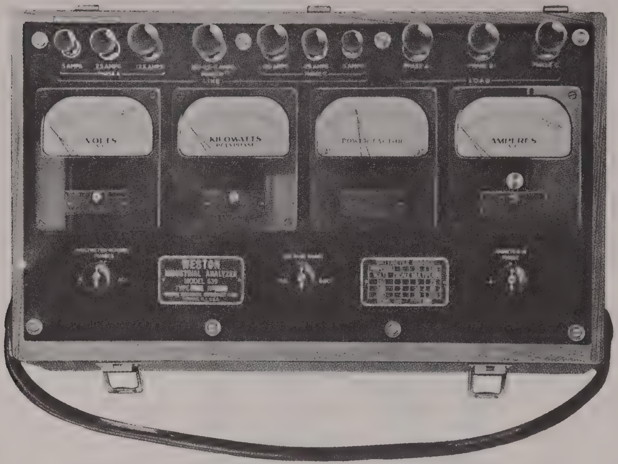
EQUIPMENT SUPPLIED:

Quant. Per Eq'pt	Name and Nomenclature	Case Mat'l	Stock Numbers (USAF) (Navy) (Army)	Overall Dimensions (inches)			Weight (Lbs.)
				H	W	D	
1	Power Test Set TS-627/U	wood	G17-P-7425(USN)	18-7/8	10-7/8	6-7/8	32

SHIPPING DATA:

No. of Boxes	Contents & Identification	Volume (Cu. Ft.)	Overall Dimensions (inches)			Weight Packed (Lbs.)
			H	W	D	
	Power Test Set TS-627/U					

SIGNAL TRACER TS-673A/U



FUNCTIONAL DESCRIPTION:

A portable, general purpose unit used for general service work during the test and repair of electronic and electric equipment. Results are indicated by means of a meter located on the front panel, and/or external headphones, oscilloscope, or vacuum-tube voltmeter.

RELATIONSHIP TO OTHER EQUIPMENT:

The Signal Tracer TS-673A/U is electrically and mechanically interchangeable with the TS-673/U except for a change in a replacement part of the arbitrary scale meter. This TS-673A/U is used with Test Prod MX-933/U and MX-934/U. The TS-673/U and Test Prod MX-933/U and 934/U are major units of Test-Tool Set AN/USM-3, AN/USM-3A, and AN/USM-3B.

ELECTROMECHANICAL DESCRIPTION:

Circuit Information: The unit consists essentially of a conventional 3-stage linear amplifier with a cathode-follower output; a metering circuit which consists

(Continued)

	AIR FORCE	NAVY	ARMY
TYPE CLASS.			
STOCK NOS.			
PROCUREM'T INFO.:			
PROCUREM'T COG.: Navy		DESIGN COG.: Navy, BuShips	
F.I.I.N.:		FUNCTIONAL CLASS. NO.: 10.1.12	

SIGNAL TRACER TS-673A/U

ELECTROMECHANICAL DESCRIPTION: (Continued):

basically of a full-wave copper oxide bridge rectifier and a DC meter; and a power supply. An audio signal applied to the input of the signal tracer is first amplified and then fed to the grid of the cathode-follower stage. The metering circuit rectifies and indicates a portion of the audio energy output of the cathode-follower, providing a means of determining relative input-voltage magnitudes.

Power Supply (External): 105 to 125 volts, AC, 50 to 1600 cycles per second, 7 watts.

Audio Frequency Range: 47 to 15,000 cycles per second.

Radio Frequency Range: 15 kilocycles per second to 400 megacycles per second, audio-modulated signals.

Audio Sensitivity: 0.002 volt audible in earphone; 0.004 volt for 1/2-scale deflection on built-in meter.

Radio Frequency Sensitivity: 0.005 volt of 50% modulated audible in earphone; 0.05 volt of 5% modulated for 1/2-scale indication on built-in meter.

MANUFACTURERS' OR CONTRACTORS' DATA:

Radio Frequency Labs., Contract No. NObsr 64817.

TUBE COMPLEMENT:

2 12AX7, 1 6AL5.

REFERENCE DATA AND LITERATURE:

TS-673A/U:
  SC Form 567.
TS-673/U:
  Catalog of Navy Material.
  NavShips 900, 155, Vol II, 91688.

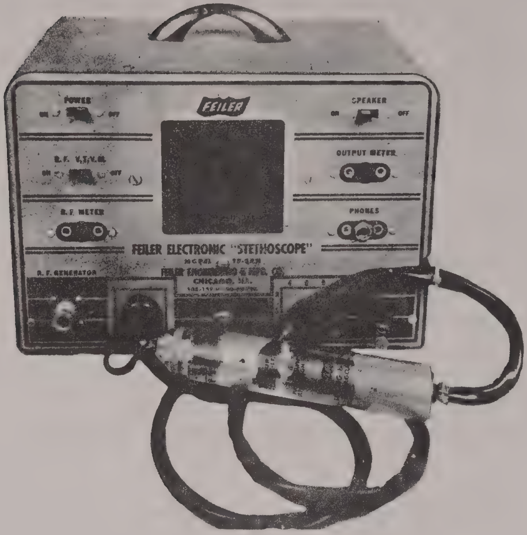
EQUIPMENT SUPPLIED:

Quant. Per Eq'pt	Name and Nomenclature	Case Mat'l	Stock Numbers (USAF) (Navy) (Army)	Overall Dimensions (inches)			Weight (Lbs.)
				H	W	D	
1	Signal Tracer TS-673A/U	phenolic		3-1/2	3	5-3/4	2

SHIPPING DATA:

No. of Boxes	Contents & Identification	Volume (Cu. Ft.)	Overall Dimensions (inches)			Weight Packed (Lbs.)
			H	W	D	
	Signal Tracer TS-673A/U					

STETHOSCOPE TS-750/URM



FUNCTIONAL DESCRIPTION:

A portable, general purpose signal tracer designed to check the performance of and maintain radio receivers such as Radio Sets AN/ARC-12 and AN/ARC-27. The tester is used for checking the frequency, amplitude, and quality of audio, low frequency, intermediate frequencies and radio frequency signals. The detected signal is applied to speaker or phone jacks located on the front panel for audible indications. A panel jack is provided for connecting an external voltmeter for the observation of an unmodulated signal.

RELATIONSHIP TO OTHER EQUIPMENT:

The Stethoscope TS-750/URM is similar to Stethoscope Feiler TS-3AN. A Voltmeter TS-375A/U and a Signal Generator Measurements 80 or equivalents are required but not supplied.

ELECTROMECHANICAL DESCRIPTION:

Circuit Information: The tester consists essentially of a high gain audio amplifier,

(Continued)

	AIR FORCE	NAVY	ARMY
TYPE CLASS.		Standard	
STOCK NOS.		R16AN-TS750URMFAKC	

PROCUREM'T INFO.: Spec MIL-D-7018(Aer); SR-190-A (BuAer)

PROCUREM'T COG.: Navy DESIGN COG.: Navy, BuAer

F.I.I.N.: FUNCTIONAL CLASS. NO.: 10.1.12

STETHOSCOPE TS-750/URM

ELECTROMECHANICAL DESCRIPTION: (Continued)

a power supply and a crystal detector. The crystal detector is housed in a high impedance probe.

Power Supply: 115 volts, AC, 50 to 60 cycles per second, single-phase.
Frequency Range: 100 cycles per second to 425 megacycles per second.
Input Impedance: 50 or 100,000 ohms.
Attenuation: 10 or 1000.

MANUFACTURERS' OR CONTRACTORS' DATA:

Feiler Engineering Company, Chicago, Illinois; Contract No. NOas-51-1222F; Approximate Cost per Unit, $124.00.

TUBE COMPLEMENT:

1 6K6GT, 1 6X5GT, 1 6AU6, 1 6BA6, 1 1N34.

REFERENCE DATA AND LITERATURE:

Radio Service Guide and Operating Instruction, Feiler Electronic Stethoscope.

EQUIPMENT SUPPLIED:

Quant. Per Eq'pt	Name and Nomenclature	Case Mat'l	Stock Numbers (USAF) (Navy) (Army)	Overall Dimensions (inches)			Weight (Lbs.)
				H	W	D	
1	Stethoscope TS-750/URM	metal	R16AN-TS-750 URMFAKC	8-1/2	11-1/2	6	
1	High Impedance Probe						

SHIPPING DATA:

No. of Boxes	Contents & Identification	Volume (Cu. Ft.)	Overall Dimensions (inches)			Weight Packed (Lbs.)
			H	W	D	
	Stethoscope TS-750/URM					

INFRARED TEST SET TS-724/SAC

(PHOTOGRAPH NOT AVAILABLE)

FUNCTIONAL DESCRIPTION:

A portable, general purpose set used to measure the output of infrared transmitters and the sensitivity of infrared receivers. It is complete in one carrying case, and consists of an infrared signal generator and an infrared signal meter. Sets of calibration curves, correction factors, and atmospheric transmission equations are attached. Output is calibrated in "equivalent" nautical mile candles, and input is calibrated in "equivalent" beam candle power.

RELATIONSHIP TO OTHER EQUIPMENT:

ELECTROMECHANICAL DESCRIPTION:

Power Supply: 105 to 125 volts, AC, 60 cycles per second, single phase.
Internal Modulation Frequency: 1500 cycles per second, sine wave or coded pulses.
Output Range: 0.5 to 8.0 "equivalent" nautical mile candles.
Input Range: 0 to 3500 and 0 to 7000 "equivalent" beam candle power.

	AIR FORCE	NAVY	ARMY
TYPE CLASS.		Standard	
STOCK NOS.			
PROCUREM'T INFO.:	Navy Spec. MIL-I-16342(BuShips)		
PROCUREM'T COG.:	Navy	DESIGN COG.:	Navy, BuShips
F.I.I.N.:		FUNCTIONAL CLASS. NO.:	10.1.13
	- Electronics Test Equipment -		TS-724/SAC

This project was supported by the USAF on Contract AF 33(600)28276 and monitored by WADC, ARDC - Carl L. Frederick, Bethesda, Md. - Multilithed in U. S. A.

INFRARED TEST SET, TS-724/SAC

MANUFACTURERS' OR CONTRACTORS' DATA:

Webster-Chicago Corporation, Chicago, Illinois; W-C Dwg. 35X090-1.

TUBE COMPLEMENT:

1 JAN-OA2, 1 JAN-5751, 1 Type-16C4, 2-NE54 (Lamps).

REFERENCE DATA AND LITERATURE:

SHIPPING DATA:

No. of Boxes	Contents & Identification	Volume (Cu. Ft.)	Overall Dimensions (inches)			Weight Packed (Lbs.)
			H	W	D	

EQUIPMENT SUPPLIED:

Quant. Per Eq'pt	Name and Nomenclature	Case Mat'l	Stock Numbers (USAF) (Navy) (Army)	Overall Dimensions (inches)			Weight (Lbs.)
				H	W	D	
1	Infrared Test Set TS-724/SAC	Poly-vinyl		10-1/2	14	9-1/2	8